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THE LANCET

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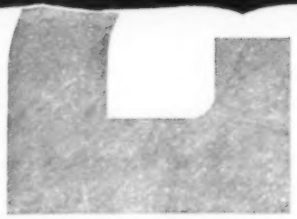

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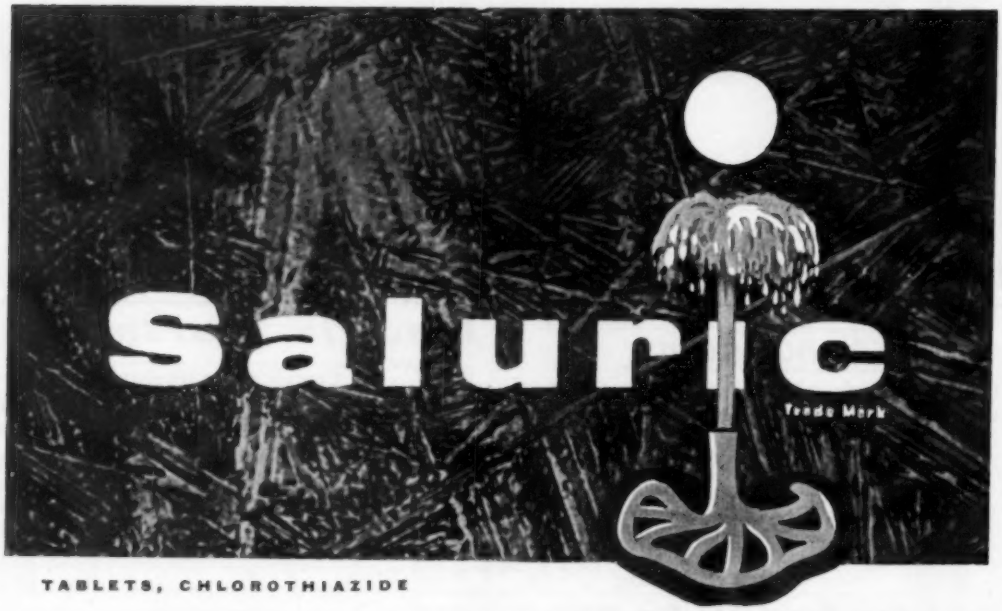

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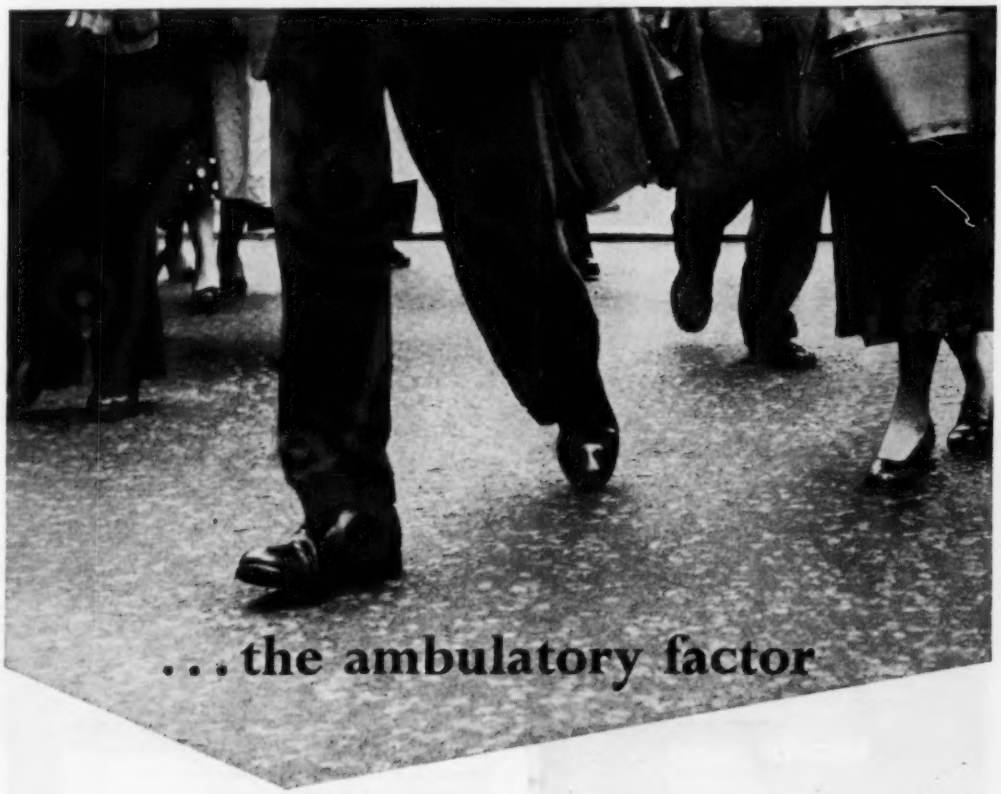

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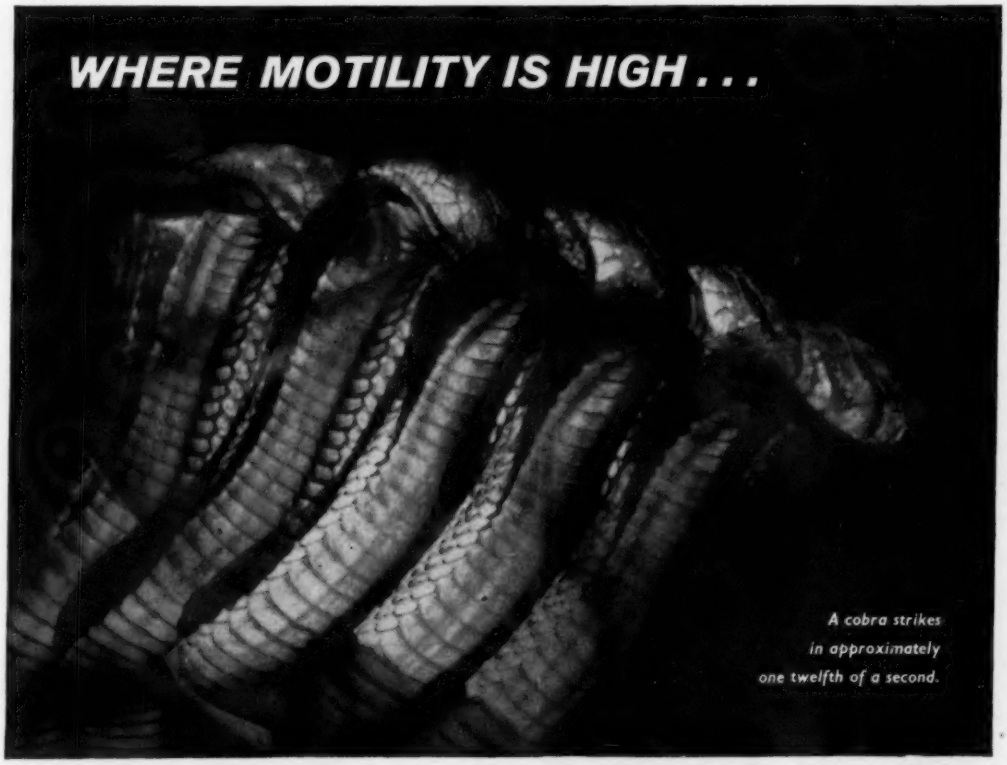

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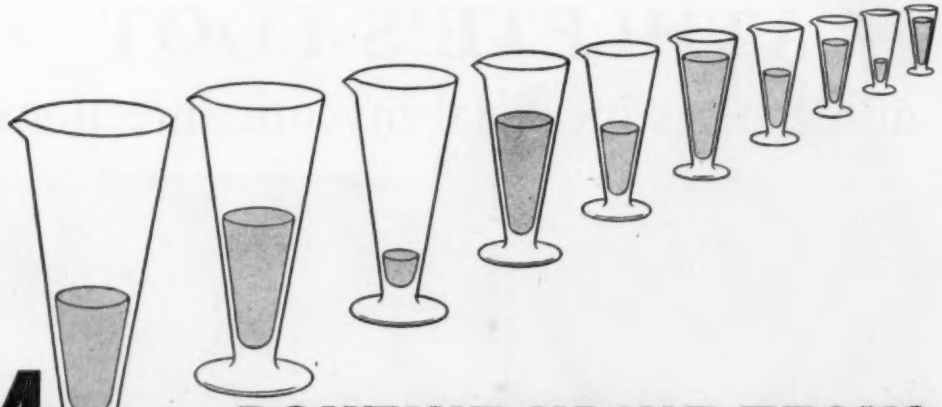

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Ambulatory Continuous Drip Method in the Treatment of Peptic Ulcer. *Amer. J. Dig. Dis.*, March 1955, **22:** 67-71

Management of Peptic Ulceration in General Practice. *Med. World*, December 1954, **81:** 591-601

Clinical Investigation into the Action of Antacids. *The Practitioner*, July 1954, **173:** 46

Further Studies on the Reduction of Gastric Acidity. *Brit. Med. J.*, 23rd January 1954, **1:** 183-184

Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. & Clin. Med.*, 1953, **42:** 955

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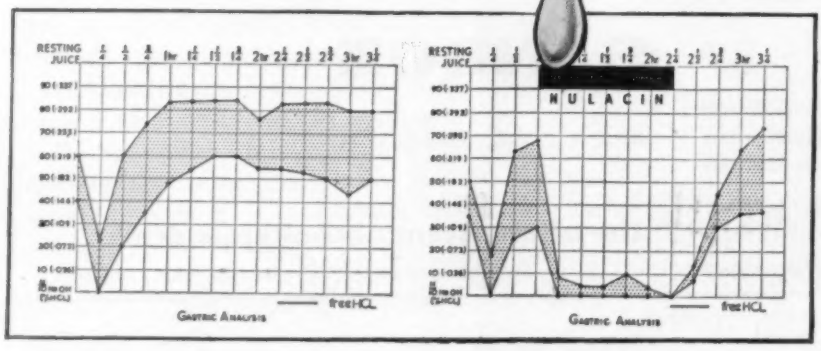

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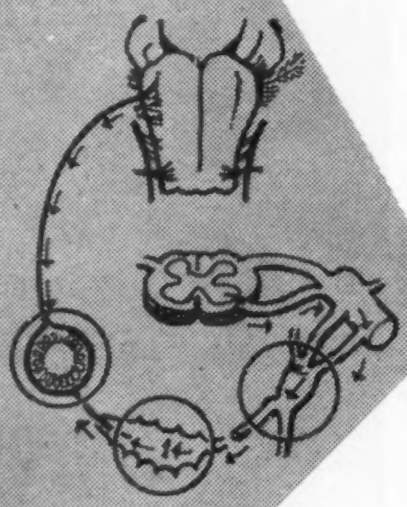

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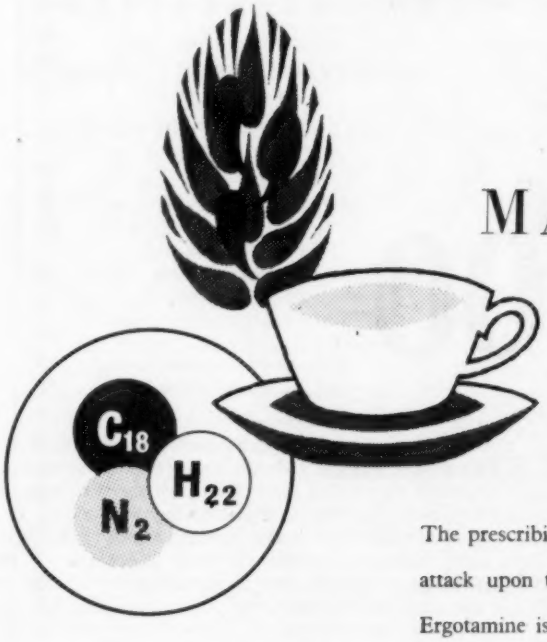

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IN 1776 Werlhof described the purpuric condition now recognised to be associated with a deficiency in the number of circulating platelets. Nothing that could influence the course of the disease was known until 1916, when Kaznelson reported a good result following splenectomy; and for the next thirty-five years this was accepted as the only effective treatment of idiopathic thrombocytopenic purpura. After the introduction of corticotrophin and cortisone into clinical practice, it was observed that their use in high dosage was followed by improvement in some patients with this condition (Medical Research Council Hæmatology Panel reports 1952, 1953, 1955).

Material

93 patients (28 males, 65 females), in whom the diagnosis of idiopathic thrombocytopenic purpura was satisfactorily established, form the basis of this paper.

Patients with thrombocytopenia associated with other hæmatological disorders or with portal hypertension, or following the use of drugs or other substances known to produce platelet deficiency, have been excluded. All had hæmorrhagic manifestations and less than 100,000 platelets per c.mm. of blood on at least two occasions. 85 patients had a prolonged bleeding-time, and of 70 in whom it was estimated, 58 had an increased capillary fragility. Smears of bone-marrow were examined in 44 cases. In all, the number of megakaryocytes was normal or increased, and no abnormality of the red cells or white cells was seen. In no case was the spleen palpable, and the weight of spleens removed surgically ranged from 50 g. to 230 g. (average 120 g., which is within the limits of normal) (McNee 1931).

13 of the cases reviewed by Robson (1949) and 8 of those reviewed by Davidson et al. (1952) have been followed up for a further period and are included in the present review.

63 patients have been followed up for at least four years.

Methods

Platelets were counted by the direct method in a counting-chamber, using capillary blood. Since 1938, all examinations have been performed in the department of medicine of Edinburgh University, the great majority by one technician. Normal values in this laboratory range from 200,000 to 500,000 per c.mm. of blood.

The bleeding-time was measured either by Duke's method (Duke 1915) or by Ivy's method (Biggs and Macfarlane 1953). The normal range is from one to six minutes.

Capillary fragility was estimated, in most instances, by the negative suction method (Scarborough 1941). Sometimes it was examined by the tourniquet method, the cuff being inflated to 100 mm. Hg for five minutes. The appearance at this time of six or more petechiæ within a circle 2·5 cm. in diameter was considered abnormal.

Throughout the series the method of *splenectomy* has been, with slight modifications, that practised by the late Sir David Wilkie.

A few points deserve emphasis. The stomach was emptied immediately before operation, and kept empty throughout by passing and retaining in position a stomach tube. The incision usually made was left paramedian through or displacing the upper part of the left rectus muscle, but in a few patients with a wide costal angle an oblique incision was made in the line of the 9th or 10th intercostal space from the left anterior axillary line across the midline. When the spleen was deeply placed or adherent, the lesser sac was entered through the gastrosplenic omentum to expose and ligate the splenic artery before beginning mobilisation of the spleen. The spleen was brought forward and downwards by dividing from below upwards the lateral leaf of the lienorenal ligament and then the remainder of the gastrosplenic ligament containing the short gastric arteries. After excision of the spleen, oozing from the raw area was reduced by suturing together the cut edges of the lienorenal and gastrosplenic ligaments, thus virtually covering the splenic bed with peritoneum. If this is done, drainage is very seldom necessary; in fact it has been employed only twice. An "anchored dressing" proved useful in preventing hæmatoma formation in the subcutaneous tissues.

In the earlier cases in this series anæsthesia was induced with ethyl chloride and continued with open ether. Latterly induction has been with intravenous thiopentone, and cyclopropane supplemented with relaxants has been used to maintain anæsthesia.

Results

CASES GIVEN NO SPECIFIC TREATMENT †

No treatment other than whole-blood transfusion or hæmatinics was given to 26 patients, of whom only 3 were under 12 years of age. They can be divided into two groups.

The *first group* consisted of 10 patients who presented with a long history of recurring episodes of bleeding into the skin or from mucous membranes. The bleeding was seldom severe and gradually subsided. Throughout observation for periods as long as twelve years these patients have shown, in addition to episodes of bleeding, persistent (or in 1 case recurring) thrombocytopenia and a prolonged bleeding-time. 3 have died—1 from gastrointestinal bleeding six months after the onset of symptoms, and 2 from causes unrelated to their thrombocytopenia five years and ten years after first being seen. In only 1 case was there a clinical and hæmatological remission. This lasted for two years, and followed a period of three years during which there had been repeated episodes of bleeding and persistent thrombocytopenia.

The *second group* comprised 16 patients in whom purpura had appeared recently and without warning. None had previously had a similar episode of bleeding.

All 16 had crops of petechiæ in the skin and mucous membranes; 12 had persistent bleeding from the nose or gums; 5 had hæmaturia; 3 had gastrointestinal bleeding; and 5 had intracranial hæmorrhage—all females, of whom 4 died. In every instance the bleeding-time was prolonged and the platelet-count below 50,000 per c.mm.; the capillary fragility was increased in 7 of the 8 cases in which it was estimated. The 4 women who died did so within two days of admission to hospital. Necropsy was performed in 3, and in each the cause of death was found to be intracranial hæmorrhage. No other

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† Throughout this paper the term "specific treatment" is used to denote steroid therapy or splenectomy.

TABLE I—SHORT-HISTORY CASES TREATED WITH CORTICOTROPHIN OR CORTICOIDS

Patient	Age	Sex	Duration of symptoms (days)	Treatment			Day platelets rose above 150,000 per c.mm.	Splenectomy	Length of follow-up (yr.)	Progress
				Drug	Dose (mg.)	Days given				
1	55	M	47	Corticotrophin	100	10	30		6	Well.†
2	20	F	3	Corticotrophin	100	10	30		6	Well.
3	32	M	30	Corticotrophin	100	3	3		6	Well.
4	3	F	2	Corticotrophin	30	17	30		1	Well.
5	33	M	2	Cortisone	100	4	4		5	Well.
6	22	F	1	Cortisone	200	10	6		1/12	Well.
7	59	M	3	Cortisone	300	8	4		3	Well.
8	6	F	12	Cortisone	100	10	8		1	Relapsed immediately, but 30 days later started a spontaneous remission. Remains well.
9	45	F	1	Cortisone	200	8	—	Yes	1	Cerebral hæmorrhage. No change in symptoms until 49 days after splenectomy when platelets rose to and have remained at normal levels.
10	26	M	21	Cortisone	200	10	—	Yes	1	Well.
11	12	M	35	Cortisone	250	21	20		1	Well.
12	29	M	1	Cortisone	300	21	21		1/12	Remains well on prednisolone 5 mg. daily.
13	31	F	6	Cortisone	200	20	—	Yes	3	Well.
14	56	F	56	Cortisone	200	21	—	Yes	4	Well.
15	69	F	21	Prednisolone	50	10	6		1	Well.
16	40	M	4	Prednisolone	50	10	—	Yes	9/12	Severe hæmorrhage continued. Splenectomy followed 10 days later by rise in platelets. Relapsed after 5 weeks. Remission with steroids. Now well.
			*1	Prednisolone	20	12	10			
17	14	M	2	Prednisolone	50	28	20		9/12	Well.
18	62	F	7	Prednisolone	50	21	—	Yes	9/12	Melæna on 28th day. Splenectomy. Well.
19	40	F	40	Prednisolone	60	24	—	Yes	1	Well.

* 5 weeks after splenectomy.
† In all tables the following terms are used:
Well.—Patient examined: free of symptoms and platelet-count within normal limits.
Presumed well.—Patient reported by letter: free of symptoms.

disease was present. The distinguishing feature of the other 12 cases was a spontaneous and apparently permanent recovery. The hæmorrhagic phenomena stopped within fourteen days of admission, and concomitantly the platelet-count began to rise, becoming normal, in every case, within a hundred days of the onset of symptoms. There has been no recurrence, and the patients have remained well for as long as they were followed up, which in 5 cases was for more than nine years.

The existence of this second form of thrombocytopenic purpura, sudden in onset and short in duration, suggested to us the arbitrary division of our patients who were treated with corticotrophin, corticoids, or splenectomy, into (1) those in whom the onset was less than a hundred days before treatment started, and in whom, therefore, the possibility of spontaneous remission was still present (hereafter referred to as short-history cases); and (2) those with a history of more than a hundred days, in whom the possibility of spontaneous remission was slight (long-history cases). Hirsch and Dameshek (1951) selected a period of a hundred and twenty days, whereas Wintrobe et al. (1937) thought that spontaneous remission was common before fifty days had elapsed but unusual thereafter. Support is lent to our choice of a hundred days as the arbitrary dividing-line by the fact that 3 patients in this series have had between them 7 children who were born with thrombocytopenia and purpura and recovered spontaneously at varying intervals up to ninety days after birth. A similar duration for this type of neonatal thrombocytopenia is recorded by Epstein et al. (1950), Neville and Masterman (1954), and Schoen et al. (1956).

It should be emphasised that the only factor taken into consideration in placing a patient in one or other of these two groups is the duration of symptoms before treatment was started. The number or severity of hæmorrhagic manifestations, the degree of thrombocytopenia, and the prolongation of the bleeding-time have not influenced the classification.

CASES GIVEN SPECIFIC TREATMENT

Short-history Cases

In 31 patients specific treatment was begun less than a hundred days from the onset of symptoms. 19 patients were treated with corticotrophin (A.C.T.H.), cortisone, or prednisolone (see tables I and VI).

In 11 cases the duration of treatment was ten days or less. There was complete remission of symptoms and a rise in platelet-count to above 150,000 per c.mm., which persisted after treatment was stopped, in 5 of these patients (nos. 3, 5, 6, 7, and 15, table I). In 1 patient (no. 8) there was a temporary improvement, followed by a relapse when the drug was withdrawn and thirty days later by a spontaneous remission which

TABLE II—SHORT-HISTORY CASES TREATED BY SPLENECTOMY

Patient	Age	Sex	Duration of symptoms before splenectomy (days)	Previous treatment	Day platelets rose above 150,000 per c.mm.	Length of follow-up (yr.)	Progress
1	18	M	2	—	1	8	Well.
2	31	M	4	—	1	12	Well 1 year. No purpura. Died from pulmonary tuberculosis.
3	47	F	4	—	1	1	Well.
4	27	M	7	—	1	3	4 weeks after operation platelet-count fell to 50,000 per c.mm. Remained low but symptoms improved.
5	45	F	9	Cortisone	49	1	No immediate response. Now well.
6	11	F	10	—	1	23	Well.
7	40	M	14	Prednisolone	10	1/2	Delayed response. Relapsed 5 weeks after operation. Now well.
8	52	F	17	—	2	7	Well.
9	54	F	20	—	23	9	No immediate response. Now well.
10	31	F	26	Cortisone	1	3	Well.
11	62	F	28	Cortisone	1	1/2	Well.
12	26	M	31	Cortisone	5*	1	Well.
13	34	F	31	—	1	17	Well.
14	30	F	40	—	1	9	Well.
15	50	F	42	—	3*	15	Except for 2 periods of 2 years each, platelets remained below 150,000 per c.mm.
16	56	F	77	Cortisone	10*	4	Well.
17	28	F	84	Cortisone	1	2	Well.
18	19	F	84	—	8*	3	Well.
19	55	F	91	—	—	6	Platelets always less than 50,000 per c.mm. Died from cerebral hæmorrhage.

* This was the first day after operation on which platelets were counted.

has now lasted for a year. No improvement was observed in 2 patients (nos. 1, 2) while they were receiving corticotrophin, but twenty days after stopping treatment there was a spontaneous remission. 3 patients (nos. 9, 10, 16) obtained no benefit from steroid therapy and were submitted to splenectomy. Of the other 8 patients, 1 (no. 4) was given corticotrophin 30 mg. daily for seventeen days, and thirteen days later experienced a complete remission, and 7 were treated with cortisone or prednisolone for three weeks or more. 3 (nos. 11, 12, 17) of these 7 patients had a complete remission starting at the end of the course of treatment and have remained well since, but 4 (nos. 13, 14, 18, 19) did not benefit and were submitted to splenectomy.

This group of short-history cases is a small one, for the condition is uncommon, and several of the patients have been treated with doses and for periods of time which would be considered inadequate by modern standards (Sturgis 1951). Nevertheless, in this group response to steroid therapy was not related either to dosage or to the duration of treatment, and in this respect our observations confirm those on idiopathic thrombocytopenic purpura reported by the Medical Research Council Hæmatology Panel (1953).

12 patients who were treated before 1949 and therefore did not receive steroids, and 7 who had failed to benefit from them, were submitted to splenectomy within a hundred days of the onset of symptoms (table II).

Operation was followed by a rise in platelet-count in 15 patients, of whom 13 have remained in complete remission for as long as they have been followed up and 2 (nos. 4 and 15, table II) relapsed within three months. 3 patients (nos. 5, 7, 9), on whom operation was performed as an emergency because of the severity of their condition, received little or no immediate benefit, but started a complete remission between ten and forty-nine days later. In 1 of these (no. 7, table II) the platelet-count fell and symptoms recurred five weeks after splenectomy, but he improved rapidly on a small dose of prednisolone. The remaining patient (no. 19) did not show any rise in platelet-count and died from a cerebral hæmorrhage some six years after splenectomy. 5 of the 7 patients in this group who failed to respond to steroids benefited clinically and hæmatologically from splenectomy.

17 short-history cases have been observed for a year or more after splenectomy. Repeated observations over periods from a year up to twenty-three years after operation indicate that a good clinical and hæmatological remission has been obtained consistently in at least 75% of short-history cases (table V).

Long-history Cases

36 patients received specific therapy more than a hundred days after the onset of symptoms.

Corticotrophin, cortisone, or prednisolone was given to 23 patients (table III). In 3 cases (nos. 1, 2, 3) this has been the only treatment given: the other 20 patients have also been treated by splenectomy. Steroid therapy was given to 11 patients only before operation, to 6 only after splenectomy had failed to relieve the condition, and to 3 both before and after operation.

The results of steroid treatment, as judged by relief of symptoms and a platelet-count above 150,000 per c.mm., were similar whether the patient received the steroids

TABLE III—LONG-HISTORY CASES TREATED WITH CORTICOTROPHIN CORTISONE, OR PREDNISOLONE

Patient	Age	Sex	Duration of symptoms (yr.)	Treatment: Drug	Dose (mg.)	Days given	Day platelets rose above 150,000 per c.mm.	Duration of platelet rise (days)	Length of follow-up (yr.)	Progress
Cases treated with steroids alone:										
1	33	F	3	Cortisone	100	12	7	4	5	Remission started 3 years later.
2	26	M	20	Cortisone	100	9	—	—	5	Well when seen 5 years later.
3	45	F	45	Corticotrophin	100	10				
				Cortisone	200	10	—	—	4	No improvement.
Cases treated with steroids followed by splenectomy:										
4	38	F	12	Cortisone	100	12	—	— •	4	Well.
5	29	F	2	Cortisone	100	15				
				Corticotrophin	160	10	—	—	5	Well.
6	40	F	5	Corticotrophin	100	14	10	4	—	3 months interval.
				Cortisone	100	21	9	11	—	1 month interval.
				Cortisone	100	10	9	—	6	Well.
7	72	F	6	Cortisone	150	22	—	—	3	No improvement.
8	66	F	5/12	Cortisone	200	10	8	2	1/2	Well.
9	57	F	2	Cortisone	200	10	7	3	3	Well.
10	16	F	3	Cortisone	300	10	—	—	2	Well.
11	50	F	5/12	Cortisone	300	22	10	12	1	Well.
12	14	F	6/12	Cortisone	200	13	15	60	3	Splenectomy 1 year later.
					300	15				
13	11	F	6	Cortisone	200	7	6			
					50	8	—	9	—	1 week interval.
				Prednisolone	15	120	14	44	—	2 months interval.
				Prednisolone	45	17	8	—	1/2	Well.
14	28	M	12	Prednisolone	50	28	—	—	1/2	Well.
Cases treated with steroids after splenectomy only:										
15	22	F	•1	Corticotrophin	100	10	—	—	6	No improvement.
16	30	F	•5	Cortisone	200	10	3	7	5	Purpura persists.
17	36	F	•12	Prednisolone	50	21	12	39	1/2	Purpura persists.
18	36	M	•10	Prednisolone	60	12	10	10	—	Course given for dental extractions.
19	33	F	•1/12	Cortisone	100	10	—	—		No change in symptoms at any time.
					75	100			2	
20	38	M	•7	Cortisone	300	21				
					200	30	—	—	—	5 months interval.
				Prednisolone	50	21				
					40	5				
					15	200	—	—	1	No change in symptoms at any time.
Cases treated with steroids before and after splenectomy:										
21	5	F	3	Cortisone	50	17	—	—	—	Well 3 years, then relapse.
			•4	Prednisolone	50	16	6	46	4	Purpura persists.
					10	270				
22	65	F	4	Cortisone	200	21				
					100	28	—	—	—	No improvement.
			•3/12	Prednisolone	60	22				
					20	39				
					10	360	—	—	1	No improvement.
23	31	F	15	Cortisone	200	21	16	4	—	No improvement.
			•1	Cortisone	300	21	11	10	—	No improvement.
					50	100	—	—	1	1 year interval.
			•2	Prednisolone	60	22	4	9	1/2	No improvement.

• Indicates that splenectomy had been performed this period of time before steroid therapy began.

before splenectomy was performed or after it had failed (table III).

Thus 17 patients were treated with steroids before operation, with 8 remissions, and 9 after operation, with 5 remissions. However, there is some evidence that higher doses of cortisone (over 200 mg. per day) and of prednisolone (over 45 mg. per day) were more effective. A rise in the platelet-count and improvement in the clinical condition were observed during only 3 of 9 courses of treatment in which doses lower than this were given, whereas with the higher dose remissions were seen 11 times out of 18. In every instance both before and after splenectomy, the remission began within sixteen days of starting treatment, but in none did it last longer than sixty days. On 7 occasions (nos. 8, 9, 11, 16, and 23, table III) the relapse began while the patient was still receiving a large dose of the drug (either cortisone 200 mg. per day or prednisolone 50 mg. per day). 2 patients (nos. 21, 23), who had responded to a large dose with a complete remission, were given long-term treatment with reduced doses, but both relapsed with symptoms comparable in severity to those before treatment was started. 3 other patients (nos. 19, 20, 22), given long-term treatment, failed to benefit in any way.

TABLE IV—LONG-HISTORY CASES TREATED BY SPLENECTOMY

Patient	Sex	Age at onset (yr.)	Age at diagnosis (yr.)	Previous treatment	Age at splenectomy	Length of follow-up (yr.)	Progress
1	F	0–1	14	—	14	29	Remitting course. Platelets 70,000 – 230,000. Symptoms improved.
2	M	0–1	5	—	5	1½	Died cerebral hæmorrhage.
3	F	0–1	20	—	20	5	Menorrhagia severe. 2 of 3 children had thrombocytopenia.
4	F	1	20	—	24	12	Menorrhagia severe.
5	F	2	5	Cortisone	5	4	Well 3 years, then relapse.
6	M	4	13	—	17	10	Well. Killed on active service.
7	M	5	5	—	6	9	Well.
8	F	5	10	Cortisone Prednisolone	11	½	Well.
9	F	6	9	—	14	9	Well. 1 of 2 children had thrombocytopenia.
10	F	11	11	—	13	5	Well.
11	F	12	12	—	14	9	Well 2 years and reported well till died suddenly in relapse.
12	F	14	15	Cortisone	15	2	Well.
13	F	16	16	Cortisone	17	2	Presumed well.
14	F	15	25	—	25	10	Symptoms unchanged.
15	F	16	30	Cortisone	31	2	Relapse after 2 weeks. Severe menorrhagia continues.
16	M	16	28	Prednisolone	28	½	Well.
17	F	18	19	—	19	24	Well.
18	F	21	22	—	24	23	Presumed well 7 years. Relapse with severe symptoms for past 16 years.
19	F	23	24	—	24	10	Well.
20	F	23	25	—	26	3	Well until death from disseminated sclerosis.
21	F	26	38	Cortisone	38	4	Relapse after 6 weeks. Platelets below 50,000 per c.mm. thereafter, but symptoms reported less.
22	M	26	28	—	28	24	Known well 3 years. Presumed well 21 years.
23	F	27	29	Cortisone	30	5	Well.
24	M	28	32	—	32	8	Severe symptoms for past year.
25	F	30	31	—	31	12	Remitting course with platelets from 30,000–280,000 per c.mm.
26	M	33	35	—	38	11	Well.
27	F	35	35	Cortisone Corticotrophin	40	6	Well.
28	F	49	50	Cortisone	50	1	Well.
29	F	52	53	—	53	2	Unchanged. Severe symptoms.
30	F	55	57	Cortisone	57	3	Well.
31	F	61	61	Cortisone	65	2	Unchanged.
32	F	66	66	Cortisone	66	½	Well.
33	F	66	68	Cortisone	72	3	Relapse after 10 days.

TABLE V—RESULT AT INTERVALS AFTER SPLENECTOMY

Period of observation (yr.)	Short-history cases					Long-history cases				
	No.	Traced	Well	Presumed well	% success	No.	Traced	Well	Presumed well	% success
1	17	17	14	—	83	30	29	17	2	65
4	10	10	6	2	80	20	18	8	3	61
8	8	8	5	1	75	14	14	5	2	50
12	4	4	2	1	75	6	6	1	1	33
20	1	—	1	—	—	4	4	1	1	50

Splenectomy was performed in 33 patients with a long history of purpura—as the only specific treatment in 19 and after the administration of steroids in 14 (table IV). Follow-up of these patients has shown that a year after splenectomy 19 of 29 patients (65%) were symptom-free and had platelet-counts and bleeding-times within the normal range, and that the proportion of those completely relieved declined to 61% at four years and to 50% or under between eight and twenty years after operation (table V).

In 22 patients the platelet-count was recorded within the first four days after operation. It was within the normal range within twenty-four hours of splenectomy in 15 and within forty-eight hours in a further 2. The other 5 patients still showed thrombocytopenia on the fourth day, and in none of them was a normal platelet-count ever observed over periods of from one to twelve years after operation.

Discussion

The results of steroid therapy are summarised in table VI.

Almost half the patients with a short history of purpura (8 of 19) developed, during the course of treatment, a complete remission which was maintained after treatment was stopped. In the group of patients with a longer history again about half (12 of 23) showed distinct improvement, but this was never maintained for more than sixty days. This seemed such an important contrast that confirmation was sought in the reported experience of other workers (Bethell et al. 1951, Fallon et al. 1952, Jacobson and Solier 1952, Meyers et al. 1952, Stefanini et al. 1952, Wilson and Eismann 1952, Adamson et al. 1953, Greene et al. 1953). Sufficient details to allow analysis were obtained for 32 patients (table VI). The results closely resemble those in our series. In a further communication Stefanini (1955) said that permanent remission following steroid therapy was common among patients with a short history, but exceptional among those with a longer history of purpura. The inference to be drawn from these observations appears to be that permanent remissions are not directly due to treatment with steroids, but may in some instances be hastened by it. If this inference is accepted, it follows that the 12 patients among our short-history cases who entered a permanent remission during or shortly after treatment with corticotrophin or steroids (tables I and V), were examples of the self-limiting type of the disease, and in this respect are comparable with the 12 patients with a short history who recovered without steroid therapy or splenectomy.

If these two groups of 12 patients, and the 4 who died without treatment within a short time of the onset of purpura, are considered together (group A, table VII) and compared with the 49 in whom the condition was

observed to run a more chronic course (group B, table VII), two features emerge.

First, in group A the sex-incidence was 15 females and 13 males (1·15 to 1), whereas in group B it was 38 females and 11 males (3·5 to 1).

Secondly, the onset of symptoms in the cases with a short history was evenly spread throughout the age range, but in the group with a long history it was before the age of 30 in 37 of the 49 cases; in 7 of the remainder, all women, the onset was in the sixth decade.

For these observed differences in sex and age incidence in our two arbitrary groups of short-history and long-history cases, we can offer no explanation and we shall draw no conclusions from them.

Idiopathic thrombocytopenic purpura may present without previous warning as an episode of mild or moderate bleeding into the skin and from mucous membranes or as an illness which is serious either because of the degree of blood-loss or, as in intracranial hæmorrhage, because the site of bleeding is particularly dangerous. It is recognised that even when no specific treatment is given, spontaneous recovery can occur. However, serious symptoms may supervene even in mild cases at any time and especially in the first few days of the disease. 4 of our patients had intracranial hæmorrhage and died within two days of first being seen. The results of steroid therapy in our short-history cases suggest that these drugs do no more than facilitate the natural tendency of this disease to spontaneous remission and possibly accelerate its onset. Evidence from our cases about the place of splenectomy in the severely ill patient with a short history is equivocal.

3 patients (2 of whom were receiving cortisone at the time) were submitted to operation because of intracranial hæmorrhage or hæmatemesis. In none was there any immediate improvement, and 2 continued to bleed considerably, until all 3 recovered apparently spontaneously between ten and forty-nine days after operation. Another patient, in whom a diagnosis of intracranial hæmorrhage was made because of the sudden onset of dysarthria and monoplegia, was not submitted to operation and made a good recovery within three weeks.

On the other hand, there is convincing evidence of the beneficial effect of splenectomy once the acute hæmorrhagic phase has passed (tables II and V) Symptoms were immediately relieved, the bleeding-time was shortened and the platelet-count rose in 13 of the 14 patients of whom full records were kept; improvement persisted in at least 75% of cases followed up for more than twelve years after operation.

Our results suggest that the initial management of the patient with a short history of purpura should be blood-transfusion to replace any serious blood-loss and administration of cortisone (75 mg. every six hours) or prednisolone (15 mg. every six hours) for three weeks. If the platelet-count rises during this time, there is a very good chance that it will be maintained. If there is no improvement within three weeks, splenectomy should be performed in the expectation that at this time it will be followed by a good result in 75% of cases. We can adduce no evidence to show that the patient in the acute hæmorrhagic phase is benefited by splenectomy.

Patients with a long history of relapsing purpura should also be given a three-week course of steroid therapy. About half of all patients (table VI) improved during or shortly after treatment, but it is evidently exceptional for any such remission to last for more than sixty days. Therefore, it seems that all these patients should be submitted to splenectomy either during the steroid-induced remission or as soon as it is apparent that the treatment has failed to influence the platelet-count. However, when a remission does occur it may be justifiable to defer operation in milder cases, especially if it is a response to the first course of steroid treatment. Delay in these circumstances is probably harmless, provided the patient is able to report frequently for hæmatological examination so that the impending relapse can be anticipated and a further course of steroid therapy given as a preliminary to splenectomy. The chances of a permanent remission following splenectomy in this group of our patients, though less than in those with a short history, were still in the region of 50% up to twenty years after operation (table V).

Lundy (1953) has drawn attention to the danger of circulatory collapse during the induction of anæsthesia, and up to seventy-two hours after operation, in patients who have been treated with corticoids over long periods or who have received reduced amounts immediately before operation. No such collapse has been observed in our patients, but it is important to keep the patient fully under the influence of these drugs for seventy-two hours after splenectomy. Thereafter the dose can be reduced over a period of seven to ten days, but may have to be raised again to the initial high level should any complications arise after operation. In our series there have been no deaths in hospital after splenectomy, and com-

TABLE VI—EFFECT OF CORTICOTROPHIN, CORTISONE AND PREDNISOLONE

Drug	Dose (mg. per day)	Short-history cases			Long-history cases		
		Sustained remission	Temporary remission	No remission	Sustained remission	Temporary remission	No remission
Corticotrophin	30	..	..	1*	..	..	..
	100	1	..	2*	..	1	3
		(4)	(1)	(3)	..	(6)	(4)
Cortisone	50–150	1	1*	..	..	2	6
		(2)	..	(2)	..	(3)	(2)
	200–300	4	..	4	..	7	3
		(2)	..	(1)	..	(1)	(1)
Prednisolone	15	..	..	..	..	1	..
	45–60	2	..	3	..	4	3
Total		8	1	10	0	12	11
		(8)	(1)	(6)	(0)	(10)	(7)

Figures in parentheses refer to cases reported by other workers (see text).
* These 4 patients subsequently had a spontaneous remission.

TABLE VII—93 CASES OF IDIOPATHIC THROMBOCYTOPENIA DIVIDED INTO GROUPS TO SHOW AGE AND SEX INCIDENCE

Age at first symptom (yr.)		0–9	10–19	20–29	30–39	40–49	50–59	60–69	70–79	Total
Short-history group (A)	Male	1	4	2	2	1	3	0	0	13
	Female	3	2	2	2	2	1	2	1	15
Long-history group (B)	Male	2	4	4	1	0	0	0	0	11
	Female	9	8	10	1	1	7	1	1	38
Unclassified because splenectomy was performed during first 100 days of disease	Male	0	1	1	1	1	0	0	0	4
	Female	0	1	2	2	2	3	2	0	12
Totals	Male	3	9	7	4	2	3	0	0	28
	Female	12	11	14	5	5	11	5	2	65

Group A comprises 28 patients: 16 who had no specific treatment; 12 who recovered within 100 days of onset and had received steroid therapy.
Group B comprises 49 patients: 10 who had no specific treatment; 33 who had splenectomy more than 100 days after onset; 3 who had splenectomy less than 100 days after onset and subsequently relapsed; 3 who had steroid therapy only more than 100 days after onset.

plications have been few and in general have been those that may follow any major upper abdominal operation.

1 patient, who was drained at the time of the splenectomy, developed a left subphrenic abscess, which needed surgical treatment on the sixteenth day after operation. She made a good recovery and was discharged home two months later. In 3 cases subcutaneous hæmatomata led to partial separation of the wound edges, but in only 1 of these was further operation needed.

Thus, in good surgical circumstances and provided the diagnosis of idiopathic thrombocytopenic purpura has been established by all means including the presence of megakaryocytes in bone-marrow smears, splenectomy is a safe operation and should not be unduly delayed. However, patients with very mild symptoms, particularly if elderly, may remain relatively undisturbed by their thrombocytopenia for a long time. 10 such patients have been followed up for periods of from three to ten years, and none of them has had symptoms sufficient to warrant admission to hospital, let alone to justify splenectomy. In such cases a watching brief may be permissible.

The management of the patient who continues to have severe symptoms after splenectomy is difficult. Long-continued treatment with cortisone (75–100 mg. per day) or prednisolone (10–15 mg. per day) was given to 5 such patients in this series (and in higher doses to another operated on more recently) without any significant improvement in platelet-counts or in the severity of symptoms. In contrast to these results, 2 of 4 patients who had failed to respond to splenectomy were treated by the Medical Research Council Hæmatology Panel (1955) with cortisone (50–100 mg. daily) for more than six months and were maintained in remission for that time. The details of these cases were not given and it may be that the 2 who were maintained had short histories and might, therefore, have remained well once a remission had been obtained—as did our case 16 (table I). Among the other reports in the literature we have failed to find an example of a patient with a *long history* of purpura having had a steroid-induced remission lasting more than two months (table VI).

The results of steroid therapy in our patients who relapsed after splenectomy (table III) suggest that if there is going to be improvement it will be evident within three or four weeks of the start of treatment, and will almost certainly not be maintained for much more than two months. If the platelet-count has not risen within this time, it is unlikely to do so with further continuous treatment, no matter how intense or how long-continued. It is better to stop treatment, accepting any minor clinical improvement that may have occurred, and to start another course should bleeding recur. Whenever a minor operation or dental extraction is necessary in a patient with a persistently low platelet-count after splenectomy, it should be covered by a course of prednisolone starting four or five days before operation and lasting not less than ten days.

Summary

93 cases of idiopathic thrombocytopenic purpura are reviewed.

The progress of 26 patients who received neither steroid therapy nor splenectomy led us to classify the remaining 67 into two groups—namely, those who had a history of less than a hundred days from the onset of symptoms to the start of treatment (short-history cases) and those in whom this interval was more than a hundred days (long-history cases).

The response to treatment in these two groups is described, and important differences in regard to prognosis and treatment are noted and discussed. Short-history cases tended to remit spontaneously, and the onset of such a remission appeared to be hastened by steroid therapy. Splenectomy was followed by good results in more than 75% of short-history cases in which a remission, spontaneous or induced, had not occurred. In long-history cases the chances of a spontaneous remission or of a lasting remission from steroid therapy are very small. Splenectomy was followed by a good result in some 50–60% of long-history cases.

Recommendations for the management of patients with idiopathic thrombocytopenic purpura are made.

We wish to express our gratitude to all those physicians and surgeons in Edinburgh who have referred to us patients with purpura or have allowed us to include patients on whom they have operated—in particular to Sir James Learmonth, in whose charge most of the splenectomies were performed. The help of our colleagues in the blood clinic and of Miss Sheila T. Lindsay, B.SC., who was responsible for most of the blood-counts, is also gratefully acknowledged.

REFERENCES

Adamson, D. G., Walker, W., McIntosh, A. E. (1953) *Brit. med. J.* ii, 656.
Bethell, F. H., Miller, S., Myers, M. C. (1951) *in* Proceedings of the 2nd Clinical Conference on A.C.T.H. (edited J. R. Mote); vol. II, Therapeutics, p. 173. Philadelphia.
Biggs, R., Macfarlane, R. G. (1953) Human Blood Coagulation and its Disorders; p. 348. Oxford.
Davidson, L. S. P., Girdwood, R. H., Swan, H. J. (1952) *Brit. med. J.* ii, 1059.
Duke, W. W. (1915) *J. Amer. med. Ass.* **65**, 1600.
Epstein, R. D., Lozner, E. L., Cobbey, T. S., Davidson, C. S. (1950) *Amer. J. Med.* **9**, 44.
Fallon, W. W., Greene, R. W., Lozner, E. L. (1952) *ibid.* **13**, 12.
Greene, R. W., Fallon, W. W., Lozner, E. L. (1953) *Amer. J. med. Sci.* **226**, 203.
Hirsch, E. O., Dameshek, W. (1951) *Arch. intern. Med.* **88**, 701.
Jacobson, B. M., Solier, W. D. (1952) *New Engl. J. Med.* **246**, 247.
Kaznelson, P. (1916) *Wien. klin. Wschr.* **29**, 1451.
Lundy, J. (1953) *Anesthesiology*, **14**, 376.
McNee, J. (1931) *Lancet*, i, 1951.
Medical Research Council Panel in Hæmatology (1952) *Brit. med. J.* i, 1261.
— (1953) *ibid.* ii, 1400.
— (1955) *ibid.* ii, 455.
Meyers, M. C., Miller, S., Linman, J. W., Bethell, F. H. (1952) *Ann. intern. Med.* **37**, 352.
Neville, M. L., Masterman, L. M. (1954) *Arch. Dis. Childh.* **29**, 163.
Robson, H. N. (1949) *Quart. J. Med.* **18**, 279.
Scarborough, H. (1941) *Edinb. med. J.* **48**, 555.
Schoen, E. J., King, A. L., Duane, R. T. (1956) *Pediatrics*, **17**, 702.
Stefanini, M. (1955) *Arch. intern. Med.* **95**, 543.
— Santiago, E. P., Chatterjea, J. B., Dameshek, W., Solomon, L. (1952) *J. Amer. med. Ass.* **149**, 647.
Sturgis, C. C. (1951) *in* Proceedings of the Conference on the Effects of Cortisone. New York.
Wilson, S. J., Eismann, G. (1952) *Amer. J. Med.* **13**, 21.
Wintrobe, M. M., Harvahan, E. M., Jr., Thomas, C. B. (1937) *J. Amer. med. Ass.* **109**, 1170.

SOME ASPECTS OF REFERRED PAIN

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THE injection of hypertonic saline solution into the deep midline structures of the back produces both local and referred pain (Kellgren 1939, Lewis and Kellgren 1939). We have found this method of inducing referred pain useful both in investigating and treating cases of spontaneous pain of doubtful ætiology and in extending the clinical examination of loss of sensation of pain in certain known lesions of the central nervous system. We report and discuss briefly here some observations made in such cases.

Lewis and Kellgren (1939) considered they were stimulating the interspinous ligaments by their injections; but

Sinclair et al. (1948a), repeating similar work with accurate radiographic control of the position of the needle point, suggested that it was the medial branch of the posterior primary division of the sensory root that was being stimulated.

There is also controversy about the more general neural mechanisms involved in referred pain. The view put forward by several workers (e.g. Harman 1948) that reference is in part a cerebral event can hardly be denied, but this must play its part *after* more distal mechanisms have operated; and about these there is still conflict.

One view (Mackenzie 1909) was that an "irritable focus" was produced at segmental level in the cord, with the result that sensation of pain from any part of the periphery of that segment spread to the central connections of all parts. In its modern guise this has become the concept of a common sensory pool of neurones fed from skin, deep structures, and viscera in the appropriate segment (Hinsey and Phillips 1940, Sinclair et al. 1948b).

The other view considers that reference takes place at the periphery by misinterpretation of impulses coming up an axon which is branched and supplies both deep structures and skin, or by antidromic impulses passing down such a branched axon and producing chemical changes at the site of referred pain, or alternatively by a combination of both these mechanisms (Lewis 1942, Sinclair et al. 1948b).

The physiological evidence on these two views has been assessed by Gordon (1975). Our observations may be relevant to, and derive added interest from, current theories of the mechanism of referred pain.

Methods and Material

When 0·3 ml. of 6% saline solution is injected as far as possible exactly into the midline of the back in the region of the interspinous ligaments at a depth of 2 or 3 cm., the immediate effect is stinging burning pain around the site of injection. This is usually bilateral but may be more on one side than the other or entirely unilateral. It subsides in one or two minutes; and, as it is subsiding, or after it has largely cleared, an unpleasant dull deep aching pain is experienced in the peripheral part of the segment injected and is sometimes accompanied by palpable spasm of the muscles of the segment. Thus, for instance, when injections are made below the L5 spinous process, pain may be experienced in the shin, and spasm of the anterior tibial muscle may be felt. The pain, although felt to be deep, can usually be clearly outlined by an intelligent witness.

Sometimes accompanying this deep pain, and sometimes more delayed, a skin tenderness may develop, again mainly in the peripheral parts of the segment involved. This hyperalgesia can become very severe and is similar to clinical hyperpathia: in the skin area involved even the lightest touch may produce severe pain, ill defined in extent and hard to describe except as very unpleasant; but the raised threshold with subsequent overaction generally defined as hyperpathia is not in evidence.

While this sensation lasts, the skin is carefully guarded from any contact, much as it is in causalgia. This hyperalgesic effect is in our experience much less common than the others. It may develop later than the deep pain and does not usually last longer than half an hour; whereas deep pain, described as vague muscle tenderness or a bruised feeling, may last as long as twenty-four hours or so after injection.

All these effects may be unilateral or bilateral. In our experience they are more commonly bilateral, especially in the cervical and thoracic regions, provided that the injection is made exactly in the midline. Though some of these referred effects follow in most cases, occasionally none of them occurs: and it must be emphasised that the only almost invariable accompaniment of the injection of saline solution is the local stinging pain.

If, instead of 6% saline solution, 2% procaine is injected in the same way, there is occasionally produced a numb cold feeling referred mainly to the periphery of the skin of the appropriate segment. There is a feeling also that the muscles underlying it are not responding with normal facility. While this effect lasts, the sensory response to both cotton-wool and pinprick in the area changes: both stimuli are considered to be less clear or less sharp. It has been impossible, however, to test

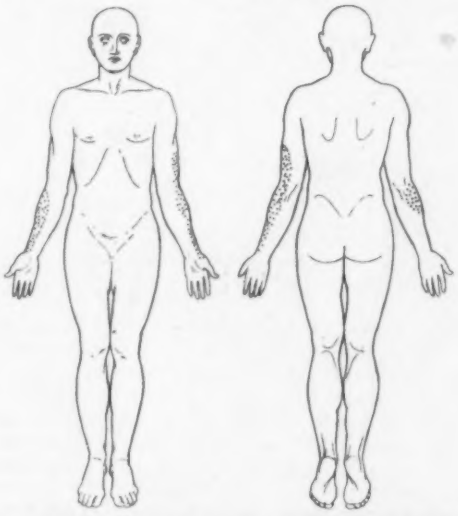

Fig. 1—Effect of 2 ml. of 2% procaine injected between C5 and C6 spinous processes in healthy person: stippled, distribution of numb cold feeling.

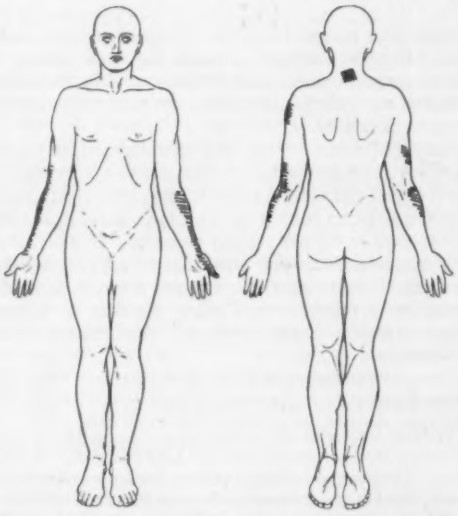

Fig. 2—Effect of 0·3 ml. of 6% saline solution injected between C5 and C6 spinous processes in healthy person: cross-hatched, distribution of immediate stinging pain; hatched, distribution of deep aching pain.

quantitatively to determine whether sensory threshold has risen or not. This effect is far less constant than that of the saline solution, and 1–2 ml. of procaine has to be used to produce it.

Fig. 1 shows the effect of such a procaine injection in a healthy volunteer. The effect was quite striking. Although the volunteer had not been instructed in what he might feel he could outline readily the areas of sensory change produced. The effect was clearcut only for fifteen minutes or so.

Fig. 2 shows the effect, on a different occasion in the same volunteer, of injecting 6% saline solution into the same area. No skin hyperalgesia was produced, the

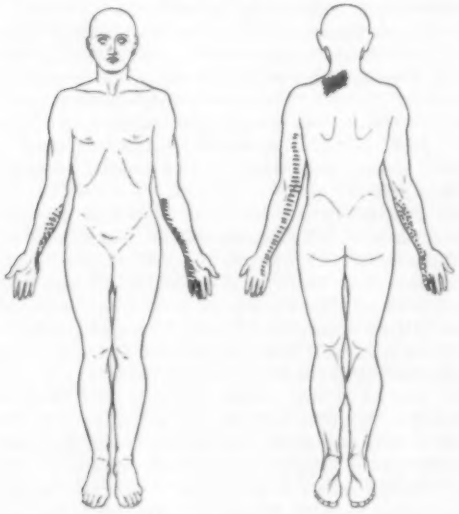

Fig. 3—Effect of 0·3 ml. of 6% saline solution injected between C7 and D1 spinous processes in case 2 with right spinothalamic loss below C6: cross-hatched, distribution of immediate stinging pain; hatched, deep aching pain; stippled, painless tingling.

hatched area representing the reference of deep aching pain. Although roughly similar, the areas are neither strictly congruous nor entirely symmetrical. Such variations and asymmetries are usual both with saline and with procaine injections.

The production of referred hypoalgesia by procaine injections alone is inconstant; but, if saline solution is first injected and procaine is injected into the same site soon after the referred pain from the saline solution has come on, this pain is usually rapidly curtailed. Equally, if pain is already present from a local lesion—e.g., herpes zoster or a painful scar—procaine injected into the appropriate interspinous segment will often produce a sustained reduction in pain and hyperalgesia; this has useful clinical applications.

Two points interested us in connection with these induced pains:

(1) *How long after the saline solution has produced referred pain will a procaine injection into the same site abolish the referred effect?* The common referred effect—the deep aching pain—is usually waning spontaneously after ten to fifteen minutes, but in a milder form it may last much longer. So far we have produced a pronounced and rapid change in the referred pain by injecting procaine up to five minutes after the injection of saline solution. Our usual procedure is to leave the saline needle in situ and to inject procaine through this; but in some cases the analgesic effect has been produced by a separate injection into the same or a very nearby site.

(2) *Will anæsthesia of the site of referred pain abolish this pain?* Conflicting evidence has been produced on this point when the question of skin pain referred from a visceral source has been investigated. Several workers have reported relief of pain by anæsthesia of the referred site (Weiss and Davis 1928, Morley 1931), whereas others have been unable to achieve this (Woollard et al. 1932, Livingston 1943). Possibly this apparent contradiction is partly due to a lack of distinction between referred pain and the less common referred skin hyperalgesia or tenderness. Lewis (1942), for instance, suggested that the mechanism of these two might differ, the hyperalgesia depending on axon reflexes, and the pain on defective localisation. A somewhat similar view was put forward by Wolff and Wolf (1948). However, the suggestion of Doran and Ratcliffe (1954) that the cord centre for summation of impulses from two sources has a threshold above which reference occurs, may be a more satisfactory explanation, because local skin anæsthesia may then only sometimes reduce summated impulses below threshold level. The following case is relevant to this problem.

Case 1.—Here saline-induced unilateral referred aching pain and skin hyperalgesia both occurred in the c7 segment: "freezing" the hyperalgesic skin with ethyl-chloride spray both abolished the hyperalgesia and greatly reduced the referred aching. As the effect wore off, apart from the transient perversion of sensation that always follows local ethyl-chloride anæsthesia, the hyperalgesia did not return and the dull ache also remained less. These later effects may simply have been the natural waning of the referred sensations, but the immediate effect was striking and occurred when the sensations were obtrusive and at their height.

The mechanism of anæsthesia by freezing must differ from that of nerve block, but in this setting it has the advantage that muscle and other deep afferents cannot be involved as they may with infiltration anæsthesia. We can therefore argue that whatever effects are seen are those of alteration of skin sensation alone, whether by simple blocking of stimuli or possibly also by "bombardment" from an intense cold stimulus.

The two following cases illustrate the ways in which the effects of injecting hypertonic saline solution may be altered by spinal-cord lesions. When spinothalamic

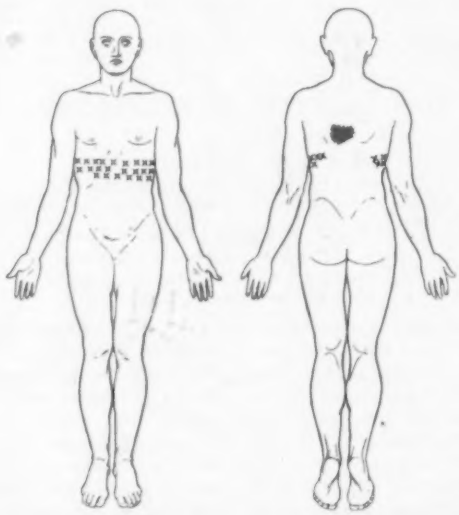

Fig. 4—Effect of 0·3 ml. of 6% saline solution injected between D6 and D7 spinous processes in case 2: cross-hatched, distribution of immediate stinging pain; small crosses, deep aching pain.

sensory loss is present from a cord lesion, it is still possible to get referred sensation by injecting hypertonic saline solution, but the sensation is modified.

Case 2.—A man, aged 22, dived into shallow water and sustained a crush fracture of the C5 vertebra. After the immediate phase of spinal concussion had subsided, he had a Brown-Sequard syndrome with paresis of his left arm and leg and sensory loss to pinprick and temperature at the C6 segment and below on the right side. There was also some posterior-column loss on the left paretic side. The condition had been static for some years when he was examined.

Injection of saline solution.—Fig. 3 shows the effect of injecting saline solution into the C7–D1 interspace. There was immediate pain in the cross-hatched area only to the left of the injection site. Some minutes later a typical dull aching pain developed in the hatched area in his left arm and hand. Shortly afterwards, however, his right forearm experienced, in the dotted area which was within the area of spinothalamic loss, a tingling feeling which was neither painful nor unpleasant and was described as " like a tuning-fork ". On another occasion he was given an injection of saline solution in the D6–D7 interspace. The effect is shown in fig. 4. Again the immediate stinging pain was felt just to the left of the injection site. Then, during the next two or three minutes, there was a slow build-up of a bilateral unpleasant dull ache, felt as deeply placed and described as like being winded. No skin hyperalgesia developed on either side. The referred sensation was clearly felt on both sides, and even on direct questioning the patient denied any difference in intensity on the two sides.

When the spinal cord is the site of a local lesion, this may also affect the site of reference of some of the sensations induced by the dorsal midline injection of saline solution, as case 3 illustrates. Some of the effects noted in this case, although quite definite, are rare in our experience; we have only been able to produce them in one other case of spinal-cord lesion, though we have tried in several

Case 3.—A boy, aged 20, was referred by the Army Medical Services because of difficulty in walking long distances.

On examination he had a very slight spastic paraparesis. There was a sensory level to light touch and pinprick at the D9 segment but no absolute sensory loss. He had some degree of kyphus at the D7–D9 vertebræ. Laminectomy later showed a cord obviously stretched over the kyphus with some arachnoid adhesions at this level.

Injection of saline solution.—The patient was tested with hypertonic saline solution some days before the operation. Fig. 5 shows the effects of an injection at the L3–L4 interspace. There was immediate stinging pain in the cross-hatched area on both sides of the injection site. As this subsided, a typical dull aching pain developed in the anterior parts of the thighs (hatched areas). There was no skin tenderness or hyperalgesia. It was thought that the left quadriceps showed slight spasm to palpation. The referred pain was more severe on this side than on the right. The acute effect subsided in about ten minutes, and there remained only a slight feeling of muscle tenderness on the left. However, about three-quarters of an hour after the injection there developed quite rapidly over two or three minutes severe hyperalgesia and tenderness of the skin over the epigastric region and lower rib margins (vertical hatching). So intense was this that the patient could not bear his pyjamas to touch the area and carefully held his clothes away from it, flinching at the slightest touch. This intense effect lasted about ten to fifteen minutes and then gradually subsided. Thirty minutes after the onset of the pain his skin was still hyperæsthetic to light touch, and pinprick felt unduly sharp, but these sensations were no longer unendurable, and he could button his jacket and tie his pyjama cord in comfort.

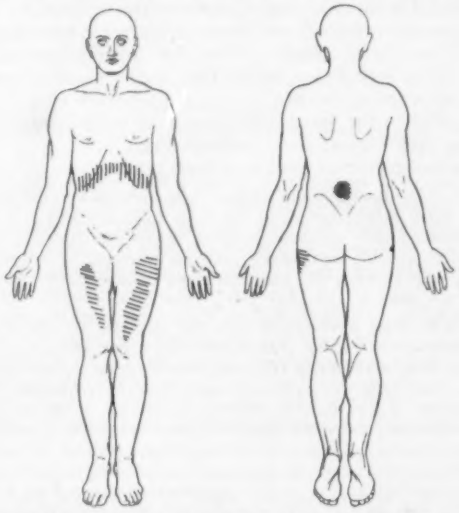

Fig. 5—Effect of 0·3 ml. of 6% saline solution injected between L3 and L4 spinous processes in case 3, with cord lesion and D9 sensory level: cross-hatching, immediate stinging pain; transversely hatched, deep aching pain; vertically hatched, acute skin hyperalgesia.

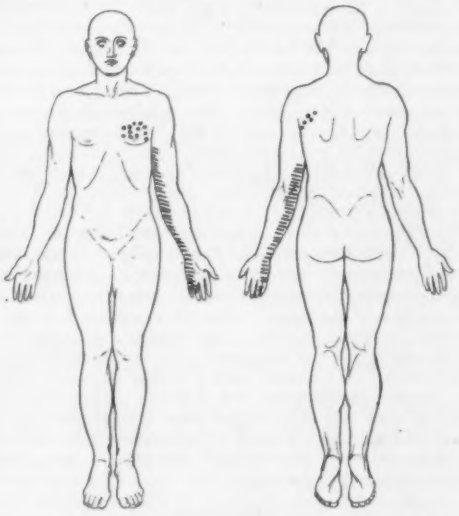

Fig. 6—Case 4 with herpes-zoster scarring (small circles) and effort angina (hatched).

Case 4 illustrates that pain referred from a superficial focus in one segment may apparently summate with other potentially painful impulses not necessarily in the same segment. The result may be pain referred to more than one segment. This type of observation is not new. Case 4 is of interest as illustrating some interconnection between three separate sources—pain of superficial origin, pain from deep somatic structures, and pain of supposedly visceral origin.

Case 4.—A woman, aged 64, had ten months' history of persistent post-herpetic pain. After some prodromal symptoms a mainly D3–D4 herpes zoster had developed on the left side. Vesication was slight and mainly on the anterior part of the body. There was no secondary infection, and subsequent scarring was slight. Nevertheless since the onset the patient

had had severe pain, felt in the skin in the affected dermatomes and deeply beneath it, almost entirely anteriorly. The area rapidly developed a typical protection hyperalgesia, and when seen she could not endure even the lightest touch to the affected area without experiencing severe, diffuse, and intensely unpleasant pain. Apart from this she had a mild hypertension. She did not complain spontaneously of any symptoms referable to her cardiovascular system, but on direct questioning she described effort angina. It appeared as a slight feeling of substernal constriction and an aching pain referred down the left arm rather diffusely, but more ulnar than radial. It could be induced fairly consistently by walking briskly twice round the ward. It subsided within a few minutes of resting. Fig. 6 shows the distribution of pain and the site of her zoster scarring.

Intercostal block.—The patient was given an intercostal block of 2% lignocaine to the D3 and D4 spaces. About 10 ml. was infiltrated in the posterior axillary line. The post-herpetic pain was immediately reduced. The hyperalgesia was abolished and the skin could be handled without discomfort. The effect lasted about an hour and a half. During this time the patient discovered that she could walk round the ward without inducing her usual anginal pain. This was put to the test and although she had the usual slight breathlessness she was emphatic that she had no arm pain.

Interspinous injection.—In the routine treatment of her post-herpetic neuralgia she was given procaine into the D3 and D4 interspinous ligaments. This relieved both the herpetic pain and the angina, the effect lasting about two hours. On another occasion hypertonic saline solution was injected into the D3 and D4 interspinous sites. This produced some increase in the herpetic pain and considerable aggravation of the hyperalgesia at the edges of the scarred area. The anginal pain was not induced, however, and her usual exertion, undertaken when the herpetic pain was aggravated, did not produce any arm pain. After repeated saline plus procaine injections to the D3 and D4 interspinous areas over a period of some days post-herpetic pain and hyperalgesia were permanently reduced. Local massage and vibration to the scarred area were made possible, and with this she has remained comfortable for a six-month follow-up period.

Discussion

The response of saline-induced pain to procaine injected at the saline site shows that referred pain, after its inception, may still depend on impulses from its primary activating focus. If chemical change at the site of reference is responsible for it, such change must be very labile and maintained in some way by the primary focus.

Anæsthetising the skin over the region to which pain is referred also appears to modify the referred pain, as shown in case 1. This is not incompatible with the previous observation if one assumes that part of the mechanism of reference is a summation of sensory inflow in the cord. In that case reducing *any* impulses which pass to the centre of summation may reduce the referred sensation.

A similar problem is posed by the observations in case 4. Weiss and Davis (1928) reported temporary abolition of angina by anæsthetising the area of skin reference. In case 4, however, even if we assume a post-fixed brachial plexus, anæsthesia of an area of painful skin a segment or two away abolished the anginal pain. Even when the painful skin area was rendered hypoalgesic as a referred phenomenon from anæsthesia of deep midline structures in the same segment, this also reduced the anginal pain. It is difficult to imagine anything more peripheral than a cord mechanism being responsible for this. The fact that temporary exacerbation of the herpetic pain by saline injection seemed to reduce anginal pain is also compatible with a cord mechanism in which stimuli may compete for a common afferent pathway; but competition for cerebral representation (Lewis 1942, Doran and Ratcliffe 1954) would also explain it.

The abolition of referred skin hyperalgesia, as distinct from pain, by anæsthetising the site of reference, which is also illustrated in case 1, is to be expected because the hyperalgesia is elicited by stimulation of the affected skin.

Mackenzie (1909) emphasised that it was almost always pain that was referred, rather than any other sensation. This has at times been used as an argument that reference is largely psychological. In case 2 there was clearcut reference of sensation to both sides of the body in the C7 segment, but on the side served by the damaged spinothalamic tract the sensation was not painful. This suggests that conduction and redistribution of impulses occur in the cord, whatever more peripheral mechanism is involved. In case 2 also referred sensation which *was* painful was felt on both sides of the body at the D6 level, but it differed in quality from the pain felt in the upper limb. As a result of the cord lesion in case 2 the appreciation of pain and temperature in the skin and pain from the compression of skeletal muscle were absent on clinical testing of the right side. It therefore seems that the pathways in the cord for these sensations may differ from those subserving the unpleasant sensation that this patient experienced bilaterally.

Kellgren (1939) and others have described a delayed onset to referred pain and hyperalgesia and have pointed out that reference is sometimes only approximately segmental. The hyperalgesic episode in case 3 was qualitatively similar to those occasionally observed at the site of referred pain and aching following the midline injection of saline solution in healthy people. However, in case 3 it was referred some six segments away from that of the saline injection; moreover it appeared at the upper level of the clinical sensory deficit. It is difficult to escape the conclusion that this delayed referred sensation involved a spinal-cord mechanism in its mode of reference and was in some way bound up with the cord lesion suggested by the clinical findings. Nathan (1956) describes a similar reference of pain beyond segmental limits in cases both with and without lesions of the spinothalamic tract. He also considers that this reference takes place at spinal-cord level, and he discusses in detail the possible anatomical and physiological basis for it. The time sequence in case 3 is also of special interest because a mechanism apparently activated by the saline solution took up to three-quarters of an hour to manifest its clinical effects.

In conclusion we emphasise three points:

(1) The clinical implications of these induced referred pains and other effects have still not been fully explored. Their application may be therapeutically rewarding; but (perhaps more important) the methods can readily be applied to healthy people to give a wider and potentially more valuable field of study.

(2) It must be accepted that the response to hypertonic saline solution varies. Occasionally there may be no referred effect at all. The same effect cannot always be reproduced in the same person even with seemingly identical technique. The structure of the nervous system, the activity of the sensory neurone pool, learnt and innate reactions to pain, and, particularly, the patient's powers of observation may all introduce variations and apparent discrepancies. The facts are largely what the patient says he feels, and accurate description is not always easy for him. The need for such accuracy is illustrated in the confusion between referred pain and referred hyperalgesia which has certainly arisen at times. Nevertheless further observations in this field are clearly worth while and will no doubt establish an agreed body of facts.

(3) Any view of the neural mechanism involved in referred pain will have to try and explain all the facts. At present there is a dichtomy of views into those concerned with peripheral mechanisms (such as pattern of peripheral sensory innervation, axon branching, and antidromic impulses) and those postulating a more central mechanism (such as a common sensory neurone pool in a segment of interconnected segments of the cord). This dichotomy seems unnecessary. There is no reason why each mechanism should not be involved in some of the effects noted, nor indeed why both should not be involved together.

Summary

The induction of referred pain by hypertonic saline solution injected into the interspinous ligaments and of referred hypoalgesia by similar injection of procaine in a healthy person is described.

The modification of such referred phenomena in cases of spinal-cord lesions is described and discussed.

A case of post-herpetic pain with referred phenomena and their modification by interspinous saline and procaine injections is described and discussed.

This paper was read by one of us (C. W. M. W.) to the section of neurology of the Royal Society of Medicine, and we have to thank the honorary editors of the society's *Proceedings* for permission to publish.

REFERENCES

Doran, F. S. A., Ratcliffe, A. H. (1954) *Brain*, **77**, 427.
Gordon, G. (1957) *Proc. R. Soc. Med.* **50**, 586.
Harman, J. B. (1948) *Brit. med. J.* i, 188.
Hinsey, J. C., Phillips, R. A. (1940) *J. Neurophysiol.* **3**, 175.
Kellgren, J. H. (1939) *Clin. Sci.* **4**, 35.
Lewis, T. (1942) Pain. London.
— Kellgren, J. H. (1939) *Clin. Sci.* **4**, 47.
Livingston, W. K. (1943) Pain Mechanisms. New York.
Mackenzie, J. (1909) Symptoms and their Interpretations. London.
Morley, J. (1931) Abdominal Pain. Edinburgh.
Nathan, P. W. (1956) *J. Neurol. Psychiat.* **19**, 88.
Sinclair, D. C., Feindel, W. H., Weddell, G., Falconer, M. A. (1948a) *J. Bone Jt Surg.* **30-B**, 515.
— Weddell, G., Feindel, W. H. (1948b) *Brain*, **71**, 184.
Weiss, S., Davis, D. (1928) *Amer. J. med. Sci.* **176**, 517.
Wolff, H. G., Wolf, S. (1948) Pain. Springfield, Ill.
Woollard, H. H., Roberts, J. E. H., Carmichael, E. A. (1932) *Lancet*, i, 337.

LEUKÆMIA: DOUBTS AND DIFFICULTIES

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WHILE engaged in a survey of the data on leukæmia contained in the records of the Ministry of Pensions and National Insurance (Abbatt and Lea 1957, Lea and Abbatt 1957) we have been much impressed by certain fundamental uncertainties: the true incidence of leukæmia in the general population; the apparent increase in the death-rate from leukæmia in the general population in 1911–55; and the identification of the various types of leukæmia. We attempt here to estimate the extent of these doubts.

True Incidence of Leukæmia in General Population

In any disease which is not compulsorily notifiable the only evidence on which an estimate of its incidence can be based is provided by the certified death-rate. In many diseases the death-rate can give no information about the incidence, but leukæmia is so extremely fatal that the death-rate must approximate very closely to the incidence. If, therefore, it could be assumed that all cases of leukæmia were diagnosed, very probably no serious error would be introduced by taking the death-rate as the incidence.

Unfortunately there is no guarantee that all cases of leukæmia are diagnosed; nor do we know of any method of estimating the size of the discrepancy. There seems to be little doubt that an unknown proportion of cases diagnosed either as aplastic anæmia or as agranulocytosis are cases of leukæmia in an aleukæmic phase. We have found 119 cases so diagnosed in the records of the Ministry of Pensions and National Insurance, which contain copies of the full notes, both Service and civilian, and in 18 of these (15%) we think the diagnosis is doubtful. Our reasons for these doubts range from pathological reports—e.g., " The predominating cell is not a typical lymphocyte but rather bigger with scanty cytoplasm; it lies somewhere between a lymphocyte and a lymphoblast; a few are definitely lymphoblasts "—to frank statements—e.g., " The possibility that the aplastic anæmia may have been preceded by an aleukæmic type of myeloid leukæmia cannot be completely ruled out ". At this date it is too late to do anything more than express doubts about these cases. Even if pathological specimens were obtainable, it seems very unlikely that any firmly based conclusions could be reached.

An unknown proportion, almost certainly small but sufficiently large to affect the apparent incidence of leukæmia, of adults over middle age certified as dying from cerebral hæmorrhage have no doubt died in that way, but the cause of the hæmorrhage has been leukæmia and not cardiovascular disease. Similarly, some cases of acute leukæmia in infancy may be confused, in the absence of hæmatological investigation, with various acute infections.

On the other hand, it seems very improbable that a death will be certified as due to leukæmia unless hæmatological investigation has been made. No such case was found in our 691 cases from the records of the Ministry of Pensions and National Insurance. It therefore does seem legitimate to conclude that the death-rates from leukæmia given by the Registrar General (1912–56) for 1911–55, do not err in the direction of overestimation, and that the rates given can be regarded as minimal.

However, it does not follow that this will continue to be so. The publicity recently given to the effects of radiation and the occurrence of leukæmia in irradiated cases of ankylosing spondylitis, goitre, persistent thymus, &c., must have produced some degree of " leukæmia-mindedness " in the medical profession. In what direction, and to what extent, such a state will affect the certification of death from leukæmia it is impossible to say, but some effect seems to be inevitable. Because of this we are of the opinion that the certified death-rates from leukæmia for the next few years are likely to be unreliable.

Apparent Increase in Death-rate from Leukæmia in 1911–55

Since 1911 there has been a great increase in the apparent death-rate from leukæmia. For males of all ages, the death-rate per thousand living in England and Wales in 1911–15 was 0·012 and for 1951–55 0·053. The corresponding figures for females were 0·010 and 0·043 (R. A. M. Case and J. T. Pearson, unpublished). The male rate has increased 4·4 times and the female 4·3. This suggests that the factors responsible for the increase apply equally to both sexes. These apparent increases, however, have not been uniformly distributed over the various age-groups, the greatest changes being in infancy and

after middle age. The question naturally arises: are these increases real, or are they artefacts brought about by such factors as changed methods of diagnosis and greater facilities for diagnosis?

There does not appear to have been much improvement in the diagnosis of leukæmia over this period. Reference to standard textbooks of medicine published at the beginning of the period shows that all the signs and symptoms of typical cases of leukæmia were well known, and that the possibility of the disease being present in obscure cases was kept in mind. The following quotation from Taylor (1914) is typical: "In any obscure illness with pallor, or enlarged glands, tonsils or spleen, or hæmorrhages, or purpura, or sloughing gums, the blood should be examined and the lymphocytes carefully estimated. A leucocytosis of any degree with 85 or 90% of lymphocytes must be regarded as lymphatic leukæmia".

Even more interesting is a quotation from Taylor (1922):

"Occasionally, however, leukæmia follows closely upon some septic, toxic, or other general condition, e.g., sepsis, bronchopneumonia, syphilis, variola or cancer, so as to have a recognised causation and deserve the name *secondary*. The cases are wanting in some of the features of primary cases, and the patients often recover."

Price's textbook (1922) states:

"Briefly it may be laid down whenever there is, even in the absence of a leukocytosis, a predominance of abnormal cells, whether these be myelocytes or 'Lymphocytes', to the extent of 25 per cent of the total, the disease is leukæmia."

It is of particular interest to note that aplastic anæmia is included with the leukæmias. The description given by Collins and Mayou (1925) of the retinal changes found in leukæmia could well be inserted into a modern textbook, and the presence of lymphomata in the lids, orbit, and ocular conjunctiva was also mentioned.

These extracts from textbooks throughout the period under investigation suggest that typical cases of leukæmia would not have been missed at those dates, and that certain cases would have been included under that diagnosis which would not be so regarded at present. Certainly such statements offer no support for the view that the apparent increase in the incidence of leukæmia is due to improvement in diagnosis.

There is no doubt at all, however, that many patients now have blood examinations as a routine measure, whereas at the beginning of the period such investigations were made only when the symptoms appeared to warrant them. It is a reasonable assumption that this must have produced an increase in the number of cases of leukæmia discovered. The greatly increased interest in pædiatrics and geriatrics in the last twenty years will have had additional weight in the extreme age-groups. Further, it is now very much easier to have blood examinations made than it was in 1911, but, so far as we can ascertain, there was little change in the availability of such examinations until about 1935.

We therefore conclude that there has not been much change in our knowledge of leukæmia from the diagnostic point of view, and that some cases which at the beginning of our period would have been included with the leukæmias would now be excluded, but facilities for diagnosis have been greatly improved. The question then arises: is there any means of estimating the magnitude of these factors?

We attempted to do this by examining our cases from the viewpoint of whether or not they might reasonably have been diagnosed if routine investigation of the blood had not been made. We assumed that all cases in which the signs and symptoms were those described in the standard textbooks would have been referred to a hospital where such examinations could be made. In our 691 cases we found 35 in which we considered that the clinical picture did not suggest the presence of a blood disease sufficiently strongly to warrant a special blood examination. These cases were diagnosed when such an examination was made only because no cause had been found for the patient's condition.

On the view that our increase in diagnostic facilities is a major cause in the apparent increase of leukæmia it would be expected that, during the war years 1941–45, since more than 5,000,000 men passed through the Forces, where ample opportunities for diagnosis existed, there would be a sudden increase compared with the previous five years, and that there would be a levelling out or even a fall in 1946–50; but this is not so. Case (1956, fig. 31) shows that in males in the Service age-groups there was no increase in the death-rate from leukæmia in 1941–45, except in the age-groups 15–19, 30–39, whereas in every age-group there was an increase in 1946–50.

Again it might be argued that, since the introduction of the National Health Service, a much larger proportion of sick persons have been investigated in hospitals, and that therefore a rise in the apparent incidence of leukæmia would be expected in the years immediately following 1947. Further, as the scheme became stabilised, this increase would flatten out, and the rate would remain more or less constant, unless the increase were real. The Registrar General (1912–56) shows that, in England and Wales in 1955, the death-rates from leukæmia for males and females of all ages are still rising. Case and Pearson (unpublished) show that the steady rise in leukæmia death-rates had begun by 1921–25, and we can find no evidence that opportunities for diagnosis had much increased before, at the very earliest, 1935.

If, as is very probable, we have become "leukæmia-minded" as a result of our association with this disease, we will have acquired a bias and will tend to suspect leukæmia in a case of any illness which does not conform to its textbook description. It is therefore possible that our selection of 35 cases (about 5%) out of the 691 is an underestimate. However, even if these 35 cases were increased to 10% or even 20% of the total they would produce little effect on a death-rate which has increased by more than 400% in the last forty-five years.

We therefore conclude that, although the improvement in the facilities for diagnosis plays a part in producing the apparent increase in the death-rate from leukæmia, this factor does not account for more than a small proportion of this change, the remainder in all probability being real.

Identification of Various Types of Leukæmia

Another feature of the published work on leukæmia is the greatest differences in the relative proportions of the various cell types cited by different workers. Since we have been unable to find any evidence of improvement in the methods of differentiating between the various types in 1940–55, we considered the possibility that a real change in the relative proportions might have taken place in this period. In our series of cases there was an increase in the proportions of both myeloid and monocytic types, with a corresponding decrease in that of the lymphatic, in this period, especially in the acute leukæmias (acute leukæmia being defined as lasting not more than six months). Calculation showed that these changes were very close to the level of significance which we use—i.e., the probability that the observed changes may be due to chance must be less than 1 in 100.

This investigation was made on the final diagnosis of each case. If the evidence could be accepted at its face value it would be of considerable interest; but we cannot accept these final diagnoses as reliable. Of 630 cases in which full details were available the diagnosis of the cell

type was changed during the course of the illness in 102 (16·2%). Of these 102 cases 72 were acute (as defined above) and 30 chronic. Of the 630 cases 370 were acute and 260 chronic; hence the changed diagnoses occurred in 19·5% of acute cases and 11·5% of chronic. It is generally agreed that great difficulties exist in determining the cell type in many acute leukæmias; hence we were not surprised to find differences of opinion in such cases. We were particularly surprised to find differences of opinion in so many chronic cases.

The details of the changes in diagnosis of the cell type were as follows:

Diagnosis on Peripheral Blood		*Diagnosis on Peripheral Blood*	*No. of cases*
Myeloid	to	Lymphatic	4
Myeloid	to	Monocytic	2
Lymphatic	to	Myeloid	12
Lymphatic	to	Monocytic	4
Monocytic	to	Myeloid	4
Monocytic	to	Lymphatic	2
Diagnosis on Peripheral Blood		*Diagnosis on Sternal Marrow*	
Myeloid	to	Lymphatic	2
Myeloid	to	Monocytic	2
Lymphatic	to	Myeloid	13
Lymphatic	to	Monocytic	3
Monocytic	to	Myeloid	3
Diagnosis on Sternal Marrow		*Diagnosis on Sternal Marrow*	
Myeloid	to	Lymphatic	1
Myeloid	to	Monocytic	2
Lymphatic	to	Myeloid	1
Diagnosis on Sternal Marrow		*Diagnosis on Peripheral Blood*	
Myeloid	to	Lymphatic	1
Diagnosis on Blood and/or Marrow		*Necropsy diagnosis*	
Myeloid	to	Lymphatic	2
Myeloid	to	Monocytic	1
Lymphatic	to	Myeloid	9
Lymphatic	to	Monocytic	3
Monocytic	to	Myeloid	3
Monocytic	to	Lymphatic	1

In 1 case lymphatic leukæmia was diagnosed on lymph-node biopsy and changed to myeloid at necropsy, but certified as lymphatic. 1 case was only diagnosed at necropsy as leukæmia of uncertain type and certified as lymphatic leukæmia. 1 case was diagnosed on peripheral blood as ? lymphatic, ? monocytic leukæmia, and as myeloid at necropsy. In 16 cases three diagnoses were made: 9 of these reverted to the original diagnosis, but in the 7 others all three possible diagnoses were made.

Six changes of diagnosis are possible, and all of them were made: myeloid to lymphatic 10, myeloid to monocytic 7, lymphatic to myeloid 35, lymphatic to monocytic 10, monocytic to myeloid 10, and monocytic to lymphatic 6.

Equally remarkable was the finding that in 30 cases the diagnosis on the death certificate differed from the necropsy or hæmatological diagnosis. This is a singular finding.

The evidence provides no grounds for regarding the second or third diagnoses as preferable to the first. In most of these cases no doubts were expressed about the original diagnosis. Most of the changes were made when the patient was moved from one hospital to another and reinvestigated. These findings necessarily throw much doubt on the value of the diagnoses in those cases in which the patient was not transferred. The question must arise: would there have been a change in the diagnosis of cell type if the patient had been investigated in another hospital? It cannot be emphasised too strongly that, although these cases of leukæmia occurred in members of the Forces, the great majority of the investigations were made in the civilian hospitals of this country. It should also be realised that most of the diagnoses were made by general pathologists and not by hæmatologists, and that though these findings are generally applicable to the United Kingdom they may differ from the results of the highly selected sample that would be obtained from teaching hospitals.

It is clear that we cannot accept our findings on the change in cell type during the past fifteen years as having any real meaning. A change may be taking place, but the possibility of wrong diagnosis is far too great for this to be anything more than a suggestion. It is also evident that any attempt to draw conclusions from the cell type given on death certificates is quite unjustifiable at present.

The remedy for this unfortunate position is not for us to discuss, but it is evident that the confusion on the type of leukæmia is very widespread. A case of particular interest in this respect was one in which, after full hæmatological investigation, the patient was, with complete notes, transferred to another hospital and at once reinvestigated on the grounds that the clinical picture did not fit the hæmatological one. In view of the uncertainty about cell type which we have shown to exist such a statement seems to have little justification, but it certainly indicates a very confused state of affairs.

Summary

The deaths from leukæmia given in the Registrar General's Statistical Reviews are unlikely to be overestimates.

Although some of the apparent increase in the death-rate from leukæmia in 1911–55 is due to improvement in diagnostic facilities, the greater part of it appears to be real.

The diagnosis of cell type in leukæmia is, at present, too unreliable for conclusions to be drawn from it; this particularly applies to conclusions drawn from death certificates.

We are indebted to Prof. J. V. Dacie and Prof. L. J. Witts for helpful advice and criticism in the preparation of this paper; and to the Chief Medical Officer of the Ministry of Pensions and National Insurance for permission to publish data taken from the records of the Ministry.

REFERENCES

Abbatt, J. D., Lea, A. J. (1957) *Lancet*, ii, 917.
Case, R. A. M. (1956) *Brit. J. prev. soc. Med.* **10**, 172.
Collins, E. T., Mayou, M. S. (1925) Pathology and Bacteriology of the Eye. London.
Lea, A. J., Abbatt, J. D. (1957) *Lancet*, i, 389.
Price, F. W. (1922) A Textbook of the Practice of Medicine. London.
Taylor, F. (1914) Practice of Medicine (edited by E. P. Poulton). London.
Registrar General (1912–1956) Statistical Review of England and Wales. London.

IMPORTANCE OF STAPHYLOCOCCUS AUREUS IN PNEUMONIA IN THE 1957 EPIDEMIC OF INFLUENZA A

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IN Sheffield the epidemic of influenza, due to the Asian variety of influenza-A virus, was at its height in September and October, 1957. In these two months 140 patients with pneumonia were admitted to the general medical wards of this hospital.

We review these cases here and discuss some factors that affected prognosis. The association between influenza-A virus and *Staphylococcus aureus* (coagulase-positive) is well recognised, and we emphasise the

TABLE I—RESULTS OF BACTERIOLOGICAL EXAMINATION OF SPUTUM AND NECROPSY MATERIAL IN 140 CASES

Organism	No. of cases
Staph aureus	38 (27%)
Pneumococci	12 (9%)
H. influenzæ	5 (4%)
Friedländer's bacillus	7 (5%)
β-Hæmolytic streptococci	2 (1%)
Coliform bacilli	10 (7%)
No significant organisms	65 (46%)
No bacteriological examination	1 (1%)
Total	140

importance of this organism both as an early and as a late bacterial invader.

Methods

A retrospective study was made of the case-notes and laboratory records for the months of September and October. The criterion for inclusion in the series was evidence of consolidation of the lung demonstrated by either radiography or necropsy.

In the laboratory each sputum was cultured aerobically on a horse-blood agar plate. Necropsy material was cultured on a blood-agar plate both aerobically and anaerobically and on a MacConkey agar plate. The plates were read after overnight incubation at 37°C. In the interpretation of cultures the presence of bacterial pathogens, especially *Staph. aureus*, was reported only when they were considered to be present in significant numbers. It has been found in this laboratory that the use of a heated blood (" chocolate ") agar plate did not appreciably increase the isolation-rate of *Hæmophilus influenzæ*, so long as small colonies, especially those showing satellitism in the presence of staphylococci, were fully examined. Most of the necropsy specimens, however, were cultured on chocolate-agar as well as on blood-agar.

Staph. aureus was identified by the slide and/or the tube coagulase test, pneumococci by their sensitivity to ethylhydrocupreine (" Optochin ") *H. influenzæ* by satellitism around a colony of *Staph. aureus* on a blood-agar plate, and coliform bacilli by colonial morphology. All organisms were checked for their morphological appearance. When pathogenic bacteria were not isolated, the result was recorded as " no significant organisms ".

Sensitivity was tested by placing antibiotic discs on a blood-agar plate inoculated with the organism on the surface, and the results were read after overnight incubation at 37°C. The organisms were tested against aureomycin, penicillin, streptomycin, chloramphenicol, erythromycin, and sulphonamides, and were recorded as being either sensitive or resistant.

Results

The results of the culture of sputum and necropsy material are set out in table I, which shows that *Staph. aureus* was isolated from 27% of the cases and pneumococci and *H. influenzæ* from only 9% and 4% respectively.

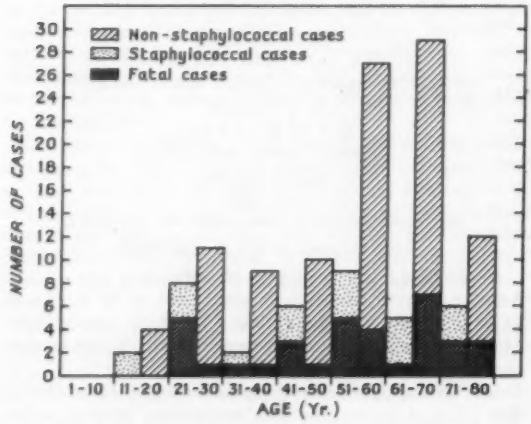

Fig. 1—Age-distribution and mortality in staphylococcal and non-staphylococcal pneumonia.

The cases can be divided into two large groups: those in which *Staph. aureus* was isolated, and those in which it was not.

The incidence and mortality, by age, in the staphylococcal and in the non-staphylococcal groups are given in fig. 1. In the staphylococcal group there were 38 cases with 18 deaths, a mortality of 47%, and in the non-staphylococcal group there were 102 cases with 16 deaths, a mortality of 16%. The overall mortality of the series was 24%. There was no clear sex difference in either group.

A further comparison of incidence and mortality, in relation to pre-existing disease, is set out in table II. Two large groups may be noted—one with no pre-existing disease and the other with chronic chest disease. There are four other small groups which are too small for comparison. In the two larger groups the mortality was much greater when *Staph. aureus* was present.

TABLE II—COMPARISON OF INCIDENCE AND MORTALITY IN STAPHYLOCOCCAL AND NON-STAPHYLOCOCCAL CASES ON THE BASIS OF PRE-EXISTING DISEASE

Clinical state	Non-staphylococcal group		Staphylococcal group	
	Total no.	No. of fatal cases	Total no.	No. of fatal cases
No previous disease	35	2 (6%)	19	8 (42%)
Chronic chest disease	48	8 (17%)	13	7 (54%)
Hypertension and ischæmic heart-disease	5	3	1	1
Pregnancy	4	0	2	1
Pregnancy and mitral-valve disease	3	1	1	1
Rheumatic heart-disease	7	2	2	0
Total	102	16 (16%)	38	18 (47%)

An analysis of the sex distribution according to age shows that males predominated in the older age-groups, because of the high incidence of chronic chest disease in this area. The relatively larger number of females in the younger age-groups may be due to the more serious prognosis of postinfluenzal pneumonia in pregnancy and rheumatic heart-disease.

There were 33 cases of pneumonia in women of child-bearing age (16–40); 10 of these were pregnant, 8 being in the third trimester (table II).

13 patients had valvular heart-disease, 11 of them having lesions of the mitral valve. Of these 11 patients with mitral disease 9 were females, and 3 died (all females).

The antibiotic sensitivity of the strains of *Staph. aureus* isolated from the 18 fatal cases are presented in table III. Antibiotic-sensitive strains are those sensitive to aureomycin, chloramphenicol, penicillin, streptomycin, erythromycin, and sulphonamides. Antibiotic-resistant strains are those resistant to aureomycin, penicillin,

TABLE III—ANALYSIS OF ANTIBIOTIC SENSITIVITY OF STRAINS OF *Staph. aureus* ISOLATED FROM 18 FATAL CASES

No. of days in hospital	Antibiotic-sensitive strains	Antibiotic-resistant strains
<1	9	0
2–7	3	2
8–14	0	2
15–21	0	1
22–28	0	1
Total	12	6

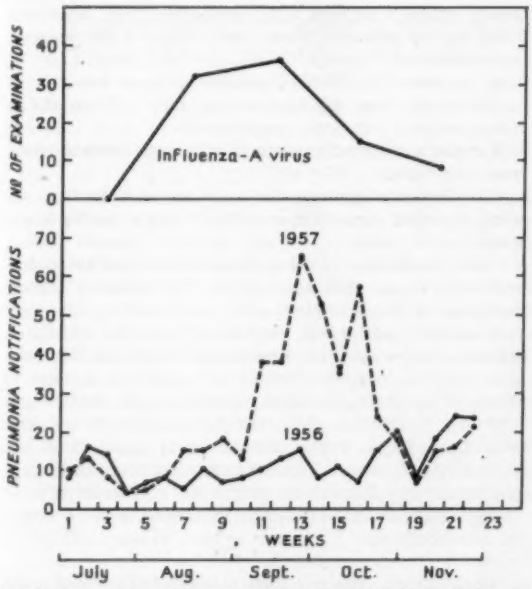

Fig. 2—Pneumonia notifications to M.O.H., Sheffield, in 1956 and 1957 and numbers of cases in which influenza-A virus was found.

streptomycin, and sulphonamides and sensitive to erythromycin and/or chloramphenicol. Erythromycin was the only one of the six antibiotics used in the laboratory routine to which all the strains of *Staph. aureus* were sensitive.

The culture results and the sensitivity of strains of *Staph. aureus* isolated on admission to hospital and in hospital are shown in table IV.

TABLE IV—ANTIBIOTIC SENSITIVITY AND RESISTANCE OF STRAINS OF *Staph. aureus* ISOLATED ON AND AFTER ADMISSION TO HOSPITAL

No. of patients with	No. of survivors	No. of fatal cases
Antibiotic-sensitive strains isolated on admission and thereafter	7	12
Antibiotic-sensitive strains isolated on admission, with antibiotic-resistant strains isolated later	2	0
No significant organisms isolated on admission, with antibiotic-sensitive strains isolated later	0	0
No significant organisms isolated on admission, with antibiotic-resistant strains isolated later	8	3
Antibiotic-resistant strains isolated at first bacteriological examination	3	3
Total	20	18

Discussion

The number of cases of infection with influenza-A virus diagnosed in the Public Health Laboratory, Sheffield, from all sources, is set out in fig. 2, which also gives the number of pneumonia notifications to the medical officer of health, Sheffield, in September and October in 1956 and 1957. Fig. 3 gives the admission-rate, by weeks of the 140 cases under discussion.

The results of the virus study reflect, to some extent, the prevalence in the community of infection by influenza-A virus. These results, in conjunction with the increase in pneumonia notifications in September and October, 1957, compared with the previous year, and in conjunction with the admission-rate of the 140 cases to hospital, tend to support the view that most of the cases under review were, in fact, of postinfluenzal pneumonia. Serological evidence of infection with, and isolation of, influenza virus A was made in a proportion of the cases. Many of the patients gave a history of a typical influenzal illness preceding the pneumonia.

The viruses of influenza B, C, and D (Sendai virus) were not detected in the community in comparable periods in 1956 or 1957. Influenza virus A was not detected in the autumn of 1956.

The fact that most of the patients had been given antibiotics before admission to hospital may explain the large number of cases (46%) in which cultures of sputum and necropsy material did not reveal any pathogenic bacteria (table I). This supposition is supported by the 10 cases (7%) in which coliform bacilli were isolated from sputum, because these bacilli are often isolated from sputum cultures made during or immediately after antibiotic therapy.

Thus the bacteriological results in this series are not directly comparable with any of the series in the pre-antibiotic era, because many of the pathogenic organisms —e.g., pneumococci and *H. influenzæ*—may have been killed or had their growth suppressed. If we accept that the low isolation-rates for pneumococci and *H. influenzæ* (9% and 4% respectively) were due to the use of antibiotics before admission to hospital, the isolation-rate of *Staph. aureus* (27%) may be lower than the true incidence. Stuart-Harris (1953) found that *Staph. aureus* was isolated from 20% of cases during an influenzal period and from 4% of cases during a non-influenzal period.

In the Public Health Laboratory, Sheffield, during 1955–57 the percentage number of sputa from which *Staph. aureus* was isolated increased during influenzal epidemics (L. Robertson and J. E. M. Whitehead, to be published).

The greater severity and mortality of the cases infected with *Staph. aureus*, along with the prevalence of the organism in sputa during influenzal periods, suggest an association between the organism and the virus. Whether this is an additive or a synergistic effect is open to speculation.

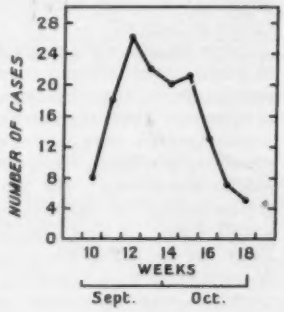

Fig. 3—Distribution of admissions of 140 patients with pneumonia to hospital.

Of the cases infected with *Staph. aureus* there are two groups large enough for comparison (table II). In the "healthy group" there were 19 patients of whom 8 (42%) died, whereas in the "chronic chest group" there were 13, of whom 7 (54%) died. As would be expected, the average age of the "chronic chest group" was higher than that of the "healthy group" owing to increasing prevalence of chronic bronchitis in the older age-groups. In 13 of 61 cases (21%) in the "chronic chest group", and in 19 of 54 cases (35%) in the "healthy group" *Staph. aureus* was isolated from either sputum or necropsy material.

Of necessity the patients admitted to hospital were selected. Those who had previously been healthy were admitted because they had a serious illness. Several had the syndrome of " peculiar cyanosis " and " gelatinous exudate " described by French (1920). Necropsy in these cases showed necrosis, in whole or in part, of the tracheobronchial epithelium. The trachea and bronchi were bathed in bloodstained purulent material. Microscopy showed numerous gram-positive cocci, and pure growths of *Staph. aureus* were obtained on culture. There was considerable pulmonary œdema, a thin serous bloodstained fluid exuding from the lungs on pressure. 1 patient presented the appearance of toxic myocarditis. In the " chronic chest group " the infection often precipitated respiratory or cardiac failure, and in the fatal cases in this group necropsy revealed more often changes of a conventional pneumonic pattern. However, some tracheal and bronchial subepithelial hæmorrhage was present in most cases.

The hospital environment is contaminated with *Staph. aureus*. With the increasing use of antibiotic and chemotherapeutic agents strains resistant to several such agents can be isolated from the noses of members of the hospital population, blankets, superficial skin lesions, &c. In a disease such as influenza, where a possible association between the virus and *Staph. aureus* can be shown, there may be a danger in introducing a patient with a postinfluenzal pneumonia not due to *Staph. aureus* into such an environment. It is thought that hospital infection did take place in this series. Thus, an analysis of the antibiotic sensitivity pattern of the strains isolated from all the cases of staphylococcal infection shows that 21 cases (table IV) had sensitive strains on admission to hospital, and that 2 of these later acquired a resistant strain. There were 11 patients from whom *Staph. aureus* was not isolated on admission to hospital but who subsequently showed evidence of infection with resistant strains. Most of the resistant strains were isolated after the first week in hospital; three of these were isolated after the temperature had subsided and the patients were recovering from the infection. No cases became superinfected with sensitive strains in hospital.

Table III, where the antibiotic sensitivity of the strains of *Staph. aureus* isolated from the 18 fatal cases is presented, shows that, in cases which were fatal within twenty-four hours of admission to hospital, all the strains isolated were sensitive to aureomycin, chloramphenicol, penicillin, streptomycin, erythromycin, and sulphonamides—i.e., the patients were infected with strains having the antibiotic sensitivity pattern that one would expect to find outside the hospital community. From the second to the seventh day after admission to hospital there were 5 deaths. From 3 of these 5 patients antibiotic-sensitive strains were isolated; from the 2 others antibiotic-resistant strains were isolated post mortem, no previous bacteriological examination having been made. In all, there were 6 fatal cases infected with resistant strains, and in 3 of the 6 cases resistant strains were isolated from the first specimens examined. Possibly the 3 patients were infected with antibiotic-resistant strains before entering hospital, but such strains are not commonly found outside the hospital community. These infections may well have been acquired while these patients were in hospital.

An example of infection in hospital with antibiotic-resistant strains of *Staph. aureus* was seen in one of the wards where 7 patients with pneumonia were admitted. From 3 patients *Staph. aureus* phage-type 77 was isolated, and these three strains, which were not present in the first specimen of sputum examined, were sensitive to erythromycin and chloramphenicol only From the 4 other patients antibiotic-sensitive strains were isolated; one strain was type 53, one type 52A, and the two others were not typed.

Bacteriophage typing of *Staph. aureus* was done on strains isolated from 16 cases. There was no predominant type.

The treatment of the fulminating staphylococcal infections is very difficult, because it is necessary to treat both the bacterial infection and the attendant pulmonary œdema and peripheral circulatory failure. 14 such patients died within the first week of admission to hospital, and all had been treated in hospital with massive doses of antibiotics, including erythromycin and chloramphenicol. Despite this treatment antibiotic-sensitive strains of *Staph. aureus* were isolated from 12 of the patients post mortem. In contrast the less severely affected patients responded well to antibiotics, and those infected in hospital with antibiotic-resistant strains responded well to the antibiotics indicated by the in-vitro sensitivity tests.

In hospitals where patients are being treated with antibiotics the nasal flora is suppressed, and it is possible that the nares can then become colonised by the antibiotic-resistant strains of *Staph. aureus* present in the hospital environment. Gould and Cruikshank (1957) have successfully suppressed *Staph. aureus* in the nares with antibacterial creams. Possibly hibitane, combined with either neomycin or bacitracin, as a nasal cream, as they suggest, would be of prophylactic value in patients admitted to hospital with postinfluenzal pneumonia who are not infected with *Staph. aureus* on admission but who are liable to become superinfected with antibiotic-resistant hospital strains of *Staph. aureus*.

It would be interesting to know whether the patients in whom postinfluenzal staphylococcal pneumonia developed were, in normal circumstances, nasal carriers of the organism, and whether the lung infection was derived from the strains present in the nose. If this were so, the 30–40% of the community at large who are nasal carriers of *Staph. aureus* would be at a special risk during influenzal epidemics.

Summary

During the influenza epidemic in the autumn of 1957 140 patients with pneumonia were admitted to this hospital.

Among the 38 patients infected with *Staph. aureus* the mortality was noticeably greater (47%) than in the remainder (16%).

There was evidence that 13 of the 140 patients were infected in hospital with strains of *Staph. aureus* which were resistant to penicillin, aureomycin, streptomycin, and sulphonamides.

We wish to thank the physicians of the City General Hospital under whose care the patients were admitted; Dr. A. J. N. Warrack for the necropsy findings; Dr. J. E. M. Whitehead for the virological investigations; Dr. E. H. Gillespie for the results of staphylococcal phage-typing; and Dr. E. H. Gillespie and Dr. J. Beasley for advice and criticism.

REFERENCES

French, H. (1920) *Rep. publ. Hlth med. Subj., Lond.*
Gould, J. C., Cruikshank, J. D. (1957) *Lancet*, ii, 1157.
Stuart-Harris, C. H. (1953) Influenza and Other Virus Infections of the Respiratory Tract. London.

METASTATIC PANOPHTHALMITIS FOLLOWING COMMONPLACE SURGICAL INFECTIONS

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PANOPHTHALMITIS is an acute purulent infection involving all the coats of the eye and usually follows a perforating wound, whether this be operative or accidental. A further means of infection is by metastatic spread from some other focus; in these cases the panophthalmitis may present either as part of a general septicæmia or as an isolated lesion, and the true nature of an inflamed and painful eye may often remain obscure until irreversible damage has been done to delicate intraocular structures. If, however, panophthalmitis is recognised early, the sight of the affected eye may be saved.

Two cases are reported here not only because of the difficulty in diagnosis but also because of the rarity of panophthalmitis now that antibiotics are used more widely in early cases of general and ocular infection.

Case-reports

Case 1.—A housewife, aged 28, reported to hospital on Feb. 17, 1957, with two weeks' history of a tender swelling of her left breast. She had previously always been well. Twenty-five days earlier she had given birth to twins and had been given stilbœstrol tablets immediately afterwards to suppress lactation. On the tenth day post partum she had in her left breast a painful swelling which was diagnosed by her doctor as an incipient breast abscess and treated with penicillin injections for a week. This produced marked symptomatic improvement, and she then applied kaolin poultices for a further week, during which time her symptoms recurred.

On examination she looked ill and had an obvious large breast abscess beginning to point vertically above the nipple. No other abnormality was found. Under general anæsthesia the abscess was incised, and about 8 oz. of thick yellow pus was evacuated from a multilocular cavity occupying the greater part of the breast. The loculi were broken down, and the cavity was drained.

Postoperative course.—On the fourth postoperative day the patient complained of watering and irritation of her right eye. Examination showed mild conjunctival injection but little else. She was treated with sulphacetamide-sodium ('Albucid') eyedrops for presumed conjunctivitis. Next day the irritation had changed to pain, her vision had become blurred, and she had ciliary injection and chemosis. Acute iritis was diagnosed and treatment begun with atropine eyedrops and hot bathing. On the sixth day hydrocortisone eyedrops were prescribed in addition to the atropine. The pain and chemosis, however, gradually increased, and on the seventh day a rise in tension of the globe was noticed. This, with the increased pain, was thought to be due to secondary glaucoma, and acetazolamide ('Diamox') tablets 500 mg. initially, followed by 250 mg. four times daily, were given. By the ninth day the pain had become very severe and throbbing and radiated to the frontal region, teeth, and nose. Chemosis was gross, as was œdema of the lids, and vision was restricted to appreciation of bright light. At this stage panophthalmitis was suspected, and a retrobulbar injection of crystalline penicillin 1,000,000 units with 2% lignocaine 0·5 ml. and hyaluronidase 1 ml. was given. Hot bathing was continued, streptomycin 0·5 g. was injected intramuscularly twice daily, and the patient was heavily sedated.

Operation.—The patient's condition having remained unchanged, on the twelfth day, under general anæsthesia, the sclera was incised at the level of the pars plana of the ciliary body. Thick pale-yellow pus was liberated. Exploration of the orbit revealed no further pus. The cornea was then incised, and pus was irrigated from the anterior chamber. Complete seclusio pupillæ was found.

Postoperative course.—Next day the patient's condition was greatly improved; the œdema, pain, and chemosis all gradually settled, and two weeks later she was discharged with a slightly painful and blind eye. During the following six months the eye became painless and then shrunken. Her breast healed normally, and at no time was there evidence of any other metastatic lesion. Her temperature was raised on admission but fell after the incision of the breast abscess. It did not rise above 99°F until the ninth postoperative day, when the panophthalmitis was fully established.

Laboratory investigations.—From both the breast and the eye similar organisms were cultured, namely coagulase-positive staphylococci sensitive to streptomycin, terramycin, and chloramphenicol but resistant to penicillin.

Case 2.—A diabetic woman, aged 46, attended hospital on Sept. 11, 1956, with a paronychia of her left index finger. She had this incised as an outpatient under local anæsthesia, and a small amount of pus was released. She was not given any antibiotics. A few days later she felt unwell and became pyrexial. On the advice of her doctor she rested in bed, but the malaise continued and she developed polydypsia and polyuria and became nauseated. On Sept. 23, 1956, she had noticed bilateral deterioration of vision, accompanied by pain in her left eye which radiated to the frontal region.

On admission to hospital on Sept. 25, 1956, her temperature was 100°F and she had glycosuria and acetonuria. Her eyelids on both sides were œdematous, there was bilateral ciliary injection, and both pupils were unresponsive to light. A cloudiness was visible in both anterior chambers, and vision was restricted in the left eye to appreciation of light and dark only, and in the right eye to appreciation of coarse hand movements.

Diagnosis, treatment, and course.—Bilateral iritis with secondary glaucoma and uncontrolled diabetes was diagnosed, and treatment with cortisone and atropine eyedrops, and with insulin was instituted. On Sept. 28, 1956, her temperature had become normal although her eyes had improved only a little. On this day a trace of albumin and some pus cells were found in her urine, and on abdominal palpation a soft spleen tip was felt. Urine and blood cultures were made, and the true nature of the ocular condition was now recognised as probably a metastatic panophthalmitis secondary to septicæmia. Treatment with crystalline penicillin 8,000,000 units daily, streptomycin 2 g. daily, and chloramphenicol 2 g. daily was begun. By Oct. 2, 1956, although the right eye was slowly improving, the left eye had lost all vision and was painful and proptosed, and there was considerable periorbital œdema.

Operation.—On Oct. 3, 1956, under general anæsthesia, the left eye was explored, found to contain a large amount of pus, and eviscerated.

Postoperative progress.—This was satisfactory, the antibiotics being discontinued on Oct. 14, 1956. The gradual improvement of the right eye was maintained, which progress was hastened by two five-day courses of corticotrophin in the next six weeks, the first course being covered by a further week's course of chloramphenicol 2 g. daily and terramycin 2 g. daily. When the patient was discharged on Dec. 3, 1956, she had been stabilised (after some early difficulty) on insulin zinc suspension 56 units daily, her left eye had healed satisfactorily, and her right eye, in which the vitreous was still clearing, had a visual acuity of 1·5/60.

Follow-up.—A year later, in November, 1957, her visual acuity was 6/60, and some scarring was visible above the macula, this presumably being the site of the original choroidal or retinal abscess. Again in this patient, in spite of septicæmia, there was no high pyrexia. At no time did her temperature rise above 101°F which was recorded only on one occasion.

Laboratory investigations.—Unfortunately the pus from the infected finger was not cultured. The blood-sugar levels on Sept. 26, 1956, were 235 mg. per 100 ml. in the morning and 255 mg. per 100 ml. in the evening. On Sept. 28, 1956, cul-

tures of blood and urine (catheter specimens) both grew *Staphylococcus aureus* slightly sensitive to penicillin and sensitive to chloramphenicol, streptomycin, and terramycin; and the number of white blood-cells was 8900 per c.mm. (polymorphs 84%, lymphocytes 14%, monocytes 2%). On Oct. 2, 1956, three days after the start of antibiotic therapy, a blood-culture again yielded staphylococci. On Oct. 16, 1956, and thereafter blood-cultures proved negative.

Discussion

Metastatic infection of the eye was first recognised by Virchow (1856) and Axenfeld (1894) published a series of such cases. Most of the cases recorded since occurred in pre-antibiotic days, when loss of the affected eye was almost inevitable. Donahue (1943), however, reported a recovery from panophthalmitis in a man, aged 52, who developed the infection a week after perurethral prostatectomy and was successfully treated with sulphadiazine. Today, with prompt antibiotic treatment (promptness is the important factor), it may be possible to save the vision of the affected eye in a large proportion of cases.

The primary lesions in published cases have ranged from otitis media and pneumonia to furunculosis (Spicer 1907), and the most usual infecting organisms have been streptococci, staphylococci, and (less commonly) coliform bacilli. The presence of frank septicæmia (as in case 2) is by no means an invariable accompaniment of metastatic panophthalmitis, but septicæmia was probably the cause of death in many of the earlier published cases.

Typically panophthalmitis is of dramatic onset, but it was not so in these two patients. Again, the temperature is commonly considerably raised; but in these two cases pyrexia was not prominent in the clinical picture. The usual presenting symptoms are pain in the eye, malaise, headache, and drowsiness, and the signs are those of conjunctival and ciliary injection, œdema of the lids, and chemosis and a hazy appearance of the cornea. The iris appears "muddy", and the posterior corneal surface becomes covered with precipitates. A vitreous haze develops, and eventually this haze increases until, on retinoscopy, all view is obscured and the yellow reflex is obtained. These signs may develop in a few hours or take several days to become manifest. Eventually the pain becomes very severe, the intraocular tension rises considerably, and the eye becomes fixed and proptosed. The differential diagnosis is from an intraorbital, as opposed to an intraocular, abscess.

The earlier that treatment is begun the better because, once suppuration has started, the delicate intraocular structures become irreversibly damaged (Duke-Elder 1940, 1954); and, even if the eye is saved, the end-result, so far as visual acuity is concerned, may be disappointing. With the first symptom or sign, treatment with atropine eyedrops and local heat, which may be applied by bathing or by short-wave diathermy, should be instituted. Cortisone locally and either corticotrophin or cortisone systemically should be tried. The antibiotic to be given will depend on the sensitivity of the organism, which may be assumed if the organisms of the original lesion have been cultured as in case 1. If the organism is not known, a conjunctival swab should be taken and treatment started with local and systemic penicillin. Locally penicillin may be administered by subconjunctival or retrobulbar injection. It is probably wise, owing to the common occurrence of penicillin-resistant infections, to combine this with some other antibiotic therapy. Penicillin given systemically does not pass the blood-aqueous barrier, hence the need for local and systemic administration, although sulphonamides do pass this barrier. Of the other antibiotics the most satisfactory, after experimental and clinical trials, appears to be chloramphenical in a dosage of up to 6 g. daily (Leopold et al. 1950). This may also, with advantage, be applied locally as drops or ointment. Terramycin appears to be relatively unsatisfactory (Sorbsy et al. 1953). If a combination of antibiotics are given at any one time, it should be remembered that they do not always exert a synergistic effect. Streptomycin may also be given by subconjunctival injection, and the intraocular levels obtained are higher if adrenaline is added to the injection.

Sorsby and Ungar (1958) have favourably reported on the use of neomycin in intraocular infections. Neomycin is a true broad-spectrum antibiotic and thus is effective against the organisms likely to be the cause of panophthalmitis. Although clinical experience of its use is limited, for subconjunctival injection neomycin 0·5 g. dissolved in 0·75 ml. of water to which 0·25 ml. of 1:1,000 adrenaline has been added is recommended. Neomycin is toxic; so probably not more than 2 g. should be administered by this route. Again, another antibiotic should be given systemically in metastatic panophthalmitis.

If the condition is recognised only at a late stage or does not respond to vigorous antibiotic therapy, resort will have to be made to surgery. Usually evisceration is the operation of choice because enucleation involves the danger of spread of the infection to the subarachnoid space round the optic nerve, leading to meningitis.

It is interesting to note that the incidence of intraocular metastatic carcinoma is very low, even in patients with widespread carcinomatosis; about 70% of those which do occur are said to be secondary to breast carcinoma (Cohen 1937).

In both cases reported here acute iritis was diagnosed in the early stages. In case 2 the true nature of the process was recognised with the development of signs of septicæmia, and prompt antibiotic treatment saved the second eye. Although coincident but quite divorced ocular conditions are undoubtedly more common in such patients, any person presenting with an acutely inflamed eye and a recent history of pyogenic infection should be suspected of having metastatic panophthalmitis, especially if the tension of the globe is raised.

Summary

Two cases of metastatic panophthalmitis, one following drainage of a breast abscess and one, which was bilateral, following a paronychia, are described.

The infrequency of metastatic panophthalmitis and the importance of early antibiotic therapy, both local and systemic, if vision is to be saved, are noted.

Any patient with an acute iritis and a recent history of pyogenic infection should be suspected of having metastatic panophthalmitis.

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REFERENCES

Axenfeld, K. T. P. P. (1894) *v. Graefes Arch. Ophthal.* **40**, 1.
Cohen, M. (1937) *Arch. Ophthal., N.Y.* **18**, 604.
Donahue, H. C. (1943) *Amer. J. Ophthal.* **26**, 283.
Duke-Elder, W. S. D. (1940) Textbook of Ophthalmology; vol. III. London.
— (1954) *ibid.* vol. VI. London.
Leopold, I. H., Nichols, A., Vogel, A. W. (1950) *Arch. Ophthal., N.Y* **44**, 22.
Sorsby, A., Ungar, J. (1958) *Ann. R. Coll. Surg. Engl.* **22**, 107.
— — Crick, R. P. (1953) *Brit. med. J.* ii, 301.
Virchow, R. (1856) *Virchows Arch.* **9**, 307.
Spicer, W. T. H. (1907) *Trans. ophthal. Soc. U.K.* **27**, 230.

TOTAL CARDIOPULMONARY BYPASS IN THE LABORATORY

A PRELIMINARY TO OPEN HEART SURGERY

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EARLY in 1957 we began work on total cardiopulmonary bypass, hoping that within a year we could employ a heart-lung machine on patients requiring deliberate open cardiac surgery. This limited aim has been achieved, and the techniques learnt in the laboratory have been translated to the operating-theatre. Lillehei et al. (1956) and Kirklin et al. (1956) in the U.S.A. had developed satisfactory bypass techniques well before we started; the most superficial study of their work reveals the stress they placed on painstaking laboratory preparation. We outline here the work done by a team anxious to gain the knowledge necessary to carry out safe total cardiopulmonary bypass.

The Apparatus

We use a Lillehei-deWall pump-oxygenator (deWall et. al, 1957) (fig. 1). The pump, a 'Sigmamotor T-6S',* has identical arterial and venous heads in which a length of latex tube is compressed against a spring-loaded back-plate by each of a series of twelve steel fingers in turn milking the blood along. The speed of action, and thus the delivery-rate of each head is independently variable. Blood passes from the caval cannulæ to the venous pump. (In the last 11 perfusions we have used a gravity drainage venous well [deWall et al. 1958].) From the pump the blood passes up a vertical tube, the oxygenator, into which oxygen is bubbled through a perforated disc at its lower end. During this ascent the blood is oxygenated and then passes down into a wider tube, the debubbler, set at 25° to the horizontal and coated with a silicone antifoam (I.C.I. M430 †) to break the bubbles; it flows from the debubbler into a long spiral tube, the helix, immersed in a thermostatically controlled water bath at a temperature of 41°C. In the helix any remaining bubbles rise, so that blood leaving the base of the helix is bubble-free. The helix also acts as a reservoir in which the volume of blood can be accurately observed. The arterial pump takes blood from the helix and passes it to the arterial cannula through a simple monofilament nylon-mesh filter, which also serves as an additional bubble trap.

Apart from the latex in the pump heads all the tubing is of transparent polyvinyl chloride.‡ The various connections, including the perforated plate for introducing the oxygen, are made of highly polished stainless steel or nylon. All apparatus in contact with blood is sterilised by autoclaving in sealed nylon tubular foil bags.§ Although providing a barrier to bacterial contamination, these bags are permeable to steam during autoclaving and allow subsequent drying.

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† Imperial Chemical Industries Ltd., Nobel Division, 25, Bothwell Street, Glasgow, C.1.
‡ Capon Heaton Ltd., Hazelwill Mills, Stirchley, Birmingham.
§ Portex Plastics Ltd., Bassett House, Hythe, Kent.

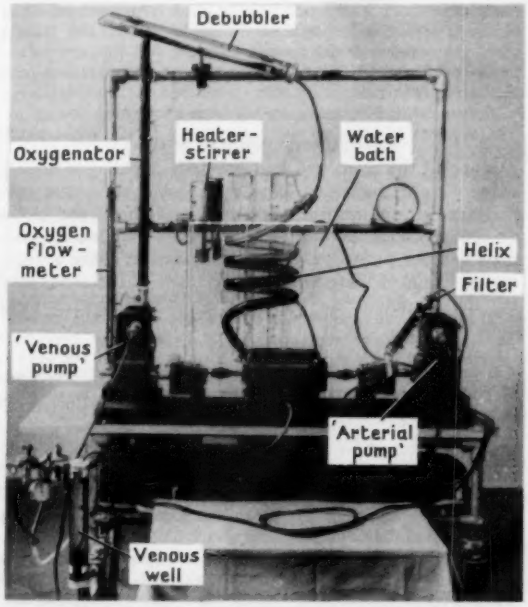

Fig. 1—Lillehei-deWall heart-lung machine, with arterial and venous hoses connected.

Preliminary Studies

Before animal work was started, many hours were spent in handling the machine so that we became familiar with its behaviour. It was found that, with correct adjustment of the back-plates, the pump output was independent of inflow pressures from −50 to +50 mm. Hg and of outflow pressures up to 400 mm. Hg.

Oxygenation was studied using fresh heparinised venous ox-blood. It was found that a ratio of oxygen to blood-flow of 5 : 1 by volume ensured 98% oxygenation at rates of flow between 500 and 800 ml. per min. of 24% oxygenated venous blood.

Mechanical hæmolysis was also studied. Plasma-hæmoglobin levels were less than 150 mg. per 100 ml. after continuous circulation of ox blood, equivalent to perfusion at 900 ml. per min. for one hour. These experiments also showed that debubbling was satisfactory.

Monitoring (fig. 2)

A monitoring technique has been established to give continuous records of the aortic and inferior vena caval pressures, electrocardiogram (E.C.G.), electroencephalogram (E.E.G.), and œsophageal temperature (fig. 2).

The recording apparatus is an Ediswan four-channel pen oscillograph. The manometers used for measuring the pressures are of a valve transducer (R.C.A.5734) type modified from a design by Arnott et al. (1951). Calibration is effected by connecting each manometer through three-way taps to a system filled with heparinised isotonic dextrose incorporating a pressure bottle and a valve¶ as a precaution against air embolism. This obviates the use of long fluid columns and thus gives a rapid and accurate method of repeated calibration.

The E.C.G. electrodes are safety-pins inserted subcutaneously in each shoulder and the left leg. The E.E.G. electrodes are two tempered-steel pins varnished except for the tips lightly hammered into the frontal and occipital regions of the skull of the

¶ The 'Oxford Safety Dropper' (Macintosh and Pask 1941), Medical and Industrial Equipment, 10–12, New Cavendish Street, London, W.1.

anæsthetised dog in the parasaggital plane. An optional earth electrode is similarly sited in the midline over the frontal sinus. A cut-out device connected with the diathermy foot pedal protects the E.C.G. and E.E.G. recorders when the diathermy is in use.

No biochemical monitoring has been performed.

Preliminary Animal Studies

None of the team had had previous experience of dog surgery or anæsthesia. The monitoring apparatus was therefore set up on three dogs under anæsthesia and blood was collected for hæmolysis experiments. In two of these dogs cadaver perfusions were performed in order to gain experience in making the necessary incisions and carrying out the cannulations. No other acute experiments were done.

Procedure

Every experiment was conducted under the same conditions as those in the operating-theatre. The dogs used were unselected mongrels weighing 7·5–17·5 kg. Large dogs were used as donors to provide blood to charge the machine. No dog was obviously ill, and no preoperative treatment was given. Preoperative hæmoglobin estimations and cross-matching of donor and recipient dogs were performed. Agglutination was occasionally seen; incompatibility was then assumed, and the donor dog changed.

Donor blood is collected by slow bleeding of the anæsthetised dog (vide infra) after cannulation of the carotid artery and external jugular vein. Before bleeding, heparin 2 mg. per kg. of body-weight is given intravenously and the blood is collected into 500 ml. bottles containing 9 mg. heparin in isotonic dextrose solution. The donor dog is killed. Meanwhile the machine is assembled, using aseptic technique, and calibrated with physiological saline solution to give the desired flow-rate (this was originally 60 ml. per kg. body-weight per min., but recently has been increased to 80 ml. per kg. per min. and above, giving total flows up to 1500 ml. per min.). The saline solution is then drained from the venous side of the machine and from the arterial side, leaving two inches in the helix and the arterial hose and filter full (280 ml.). The machine is charged with 800–1000 ml. of donor blood. This provides a helix content during perfusion equivalent to approximately half a minute's flow. (This is only half the amount in the helix recommended by Lillehei [deWall et al. 1958]. Though we were aware of this, we wished to economise on donor dogs. Using the machine with this small charge provided a more stringent test of the efficiency of the helix and also gave less latitude for errors in handling the machine.) The arterial and venous hoses are connected to each other, the pumps are started, and the blood is circulated. The hoses are inspected until all bubbles have been removed from the arterial side.

Anæsthesia

Anæsthesia is induced in the unpremedicated dog with thiopentone 10 mg. per kg. body-weight and succinylcholine chloride 1 mg. per kg. body-weight intravenously. The dog is intubated and anæsthesia is maintained with nitrous oxide and oxygen in a semiclosed circuit incorporating a Waters' canister. Increments of up to a quarter of the induction dose of barbiturate or relaxant are given as required. Atropine 0·66 mg. (gr. $^1/_{100}$) is given intravenously at the time of induction and repeated later if excessive salivation occurs.

The Surgical Approach

The dog is placed on a heated operating-table and the operation fields are prepared by clipping, shaving, and washing the skin. The E.C.G. and E.E.G. electrodes and the œsophageal thermometer lead are inserted, and the diathermy earth electrode is applied. Benethamine penicillin 600,000 units and streptomycin 0·5 g. are given intramuscularly. An intravenous drip through a Guest cannula is set up in the cephalic vein. The clotting-time of the venous blood is done by the Dale and Laidlaw (1911) method. 1 mm. nylon cannulæ for the manometers are inserted into the abdominal aorta and inferior vena cava through the femoral vessels.

A longitudinal incision is made in the neck for access to the left common carotid artery. A right fourth interspace thoracotomy is made to expose the heart and the great vessels. (In the last eight perfusions a bilateral transternal thoracotomy has been carried out, allowing left brachial instead of carotid cannulation.) Before the vessels are cannulated heparin 2 mg. per kg. is given intravenously. Thin rubber tubes are passed around the superior and inferior venæ cavæ at their junction with the right atrium to act as tourniquets. The arterial cannula is of the design described by Drew et al. (1957), but the rigid parts are of nylon. In only two dogs have we failed to insert an arterial cannula at least 3·8 mm. in internal diameter. The venous cannulæ, which are simple vinyl tubes, have never been of a smaller internal diameter than 4 mm. and are usually 6 mm. (For the first thirty experiments they were passed into the venæ cavæ through separate auricular incisions, but now a single incision is made in the auricular appendage and the

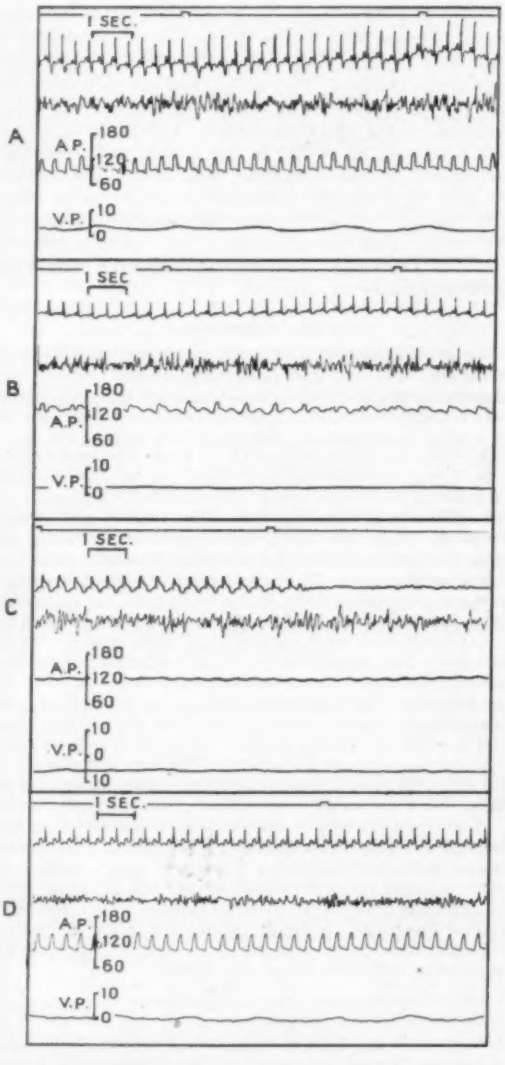

Fig. 2—Monitoring record in dogs, showing E.C.G., E.E.G., aortic pressure (mm. Hg), and inferior vena caval pressure (mm. Hg): *a*, typical pre-perfusion record; *b*, typical perfusion record; *c*, potassium arrest; *d*, recovery period.

cannulæ are passed through two holes bored in a sponge-rubber grummet inserted in this incision.)

During the whole of the operation meticulous hæmostasis is maintained; the total blood-loss, including that due to cannulation, is rarely as much as 30 ml. before perfusion, measured by swab-weighing.

The Perfusion

Immediately before connecting the hoses to the cannulæ the blood is circulated for a minute and the hoses are again inspected for the presence of bubbles on the arterial side. A bubble-free junction is then made between the arterial hose and the arterial cannula. The venous hose is joined to the two venous cannulæ by means of a stainless-steel Y tube, small bubbles being of no moment. Perfusion is begun by starting the machine, unclamping the hoses, and tightening the caval tourniquets.

The animal is then on total cardiac bypass. We have never failed to achieve satisfactory perfusion as evidenced by adequate arterial-perfusion pressure (80/60 to 140/100 mm. Hg), and a satisfactory grade of E.E.G. (Hudson 1958) (fig. 2). The main task of the pump operator during perfusion is to maintain a constant volume in the helix. If perfusion is unsatisfactory, it is corrected on information from the monitor and from the pump operator.

On sixteen occasions simple perfusion varying in duration from 10 to 75 minutes has been performed. In the remaining experiments, satisfactory perfusion having been established, a further procedure has been carried out. In six perfusions the heart has been arrested with potassium citrate and in the remaining twenty a right ventriculotomy has been performed, sixteen of these on the potassium-arrested heart (see accompanying table and fig. 3).

Potassium Arrest

The first five potassium arrests (Melrose et al. 1955) were done by aortic injection, but this resulted in such troublesome bleeding from the puncture that all subsequent arrests were done by injection into the left ventricle. None of the twenty-two hearts arrested with potassium has failed to restart and ultimately to maintain effective circulation with a normal arterial pressure. The period of recovery, however, has been as long as 25 minutes, and has been punctuated by episodes of atrioventricular dissociation, ventricular asystole, ventricular tachycardia, and ventricular fibrillation. Ventricular asystole and bradycardia due to heart-block occurring after the heart is closed cause distension of the heart due to coronary-sinus return, and on these occasions an artificial pacemaker (Lightwood 1958a) has been used to stimulate the heart to eject its contents. Ventricular fibrillation has been stopped by an electrical defibrillator, employing a 300-volt D.C. shock of $^1/_{50}$ second duration (Lightwood 1958b). Cardiac bypass has always been maintained until sinus rhythm has been re-established and effective left ventricular ejection observed on the aortic pressure tracing.

Perfusion is ended by releasing the caval tourniquets, stopping the pump, and simultaneously clamping the arterial and venous hoses. The arterial and venous cannulæ are removed; the artery and the right auricular appendage are ligated and transfixed.

Closure

Protamine sulphate 0·5% is given very slowly intravenously until a total of 2 mg. protamine for each mg. heparin used has been given. The clotting-time is then repeated and increments of protamine 0·25 mg. per mg. heparin are given if necessary until the clotting-time is within 20 seconds of its original value. We think this is preferable to protamine titration (Perkins et al. 1956), which is slow and complicated. We have had no difficulty in restoring the clotting-time to normal and

DATA ON PERFUSION EXPERIMENTS IN DOGS

Experiment no.	Duration of perfusion (min.)	Flow-rate: Total (ml. per (min.)	Flow-rate: ml. per kg. per min.	Procedure	"Walking time"	Survival-time (days)	Causes of death
1	10	600	63	P	4 hr.	Kd., 14	..
2	15	500	42	P	1 day	Kd., 17	..
3	30	550	60	P	..	1	Hole in superior vena cava, hæmothorax, collapse of rt. lung
4	30	697	56	P	1 day	Kd., 5	Symptoms of distemper; at necropsy, pneumonia
5	45	455	38	K	4 hr.	Kd., 15	..
6	36	484	51	P	..	2 hr.	Spontaneous respiration but never conscious; at necropsy, gross fatty liver
7	12	550	42	P	..	4 hr.	Accidental overtransfusion
8	30	600	47	P	6 hr.	Kd., 15	..
9	45	550	58	P	3 hr.	Kd., 17	..
10	45	560	56	K	12 hr.	4	Anæmic postoperatively; transfused; "paraplegic" after 2 days; at necropsy, bilateral cerebral infarcts
11	30	600	60	K	2 hr.	Kd., 16	..
12	45	750	61	P	2 hr.	Kd., 15	..
13	45	860	61	K	..	2	Comatose 2nd day; at necropsy, cerebral œdema
14	41	900	60	K and V	20 hr.	Kd., 18	..
15	46	370	41	V	$1^1/_2$ hr.	Kd., 14	..
16	45	600	70	P	..	8 hr.	Hæmothorax; overtransfused with citrated blood; at necropsy, gross venous congestion
17	45	500	67	V	1 day	Kd., 14	..
18	33	667	55	K and V	..	12 hr.	Overtransfused; at necropsy, aneurysm of right ventricle and gross venous congestion
19	43	750	58	K and V	..	8 hr.	Overtransfused; at necropsy, gross venous congestion
20	35	500	43	K and V	..	2 hr.	Overtransfused; at necropsy, gross venous congestion
21	30	666	63	P	3 hr.	Kd., 15	..
22	40	750	70	V	4 hr.	Kd., 21	..
23	50	540	65	V	4 hr.	Kd., 21	..
24	21	700	64	P	..	12 hr.	Paraplegic, but conscious; perfusion death
25	36	700	56	K	15 min.	Kd., 21	..
26	28	700	63	P	$1^1/_2$ hr.	3	Hypotensive during operation; at necropsy, bronchopneumonia
27	65	600	66	K and V	30 min.	Kd., 15	..
28	38	750	65	K and V	2 hr.	8	Wound dehiscence; bilateral pneumothorax
29	21	600	67	P	$1^1/_2$ hr.	8	Wound dehiscence, empyema; death during surgical decortication
30	30	855	75	P	1 hr.	Kd., 14	..
31	30	780	60	K	1 hr.	Kd., 14	..
32	31	850	74	K and V	5 hr.	Kd., 17	..
33	39	850	77	P	2 hr.	Kd., 15	..
34	76	800	76	K and V	12 min.	Kd., 14	..
35	25	850	81	K and V	..	4 hr.	Neurological signs of cerebral damage
36	24	880	70	K and V	2 hr.	Kd., 14	..
37	49	930	85	K and V	20 min.	Kd., 14	..
38	41	1020	85	K and V	9 hr.	Kd., 14	..
39	43	750	94	K and V	1 hr.	8 hr.	Helix emptied during perfusion; neurological signs of cerebral damage
40	55	850	95	K and V	8 hr.	Kd., 14	..
41	45	1250	66	K and V	1 day	Kd., 14	..
42	32	1500	97	K and V	2 days	Kd., 9	..

P = simple perfusion. K = perfusion and elective potassium arrest. V = perfusion and right ventriculotomy.
"Walking-time" = time from insertion of last stitch to walking. Kd. = killed on or after 14th postoperative day (excluding dog 42, killed at 9 days).

have never seen a hæmorrhagic state after perfusion.

Throughout the procedure a blood-balance chart is kept (Patrick et al. 1957). This enables the dog's blood-volume to be restored by the end of the operation to slightly more (70 ml.) than its preoperative value, thus allowing for post-operative chest drainage.

A Winsbury-White catheter is placed anteriorly in the fifth or sixth intercostal space and connected to a graduated bottle with an underwater seal. The wound is then closed with interrupted silk sutures. The manometric cannulæ are withdrawn, the femoral vessels are tied, and the thigh wound is closed. All the attachments to the dog except the intercostal tube are removed. Meanwhile the anæsthetic is stopped, but the endotracheal tube is left in place until spontaneous respiration is adequate. The intercostal catheter is clamped, but is connected at intervals to the drainage bottle to which suction is applied.

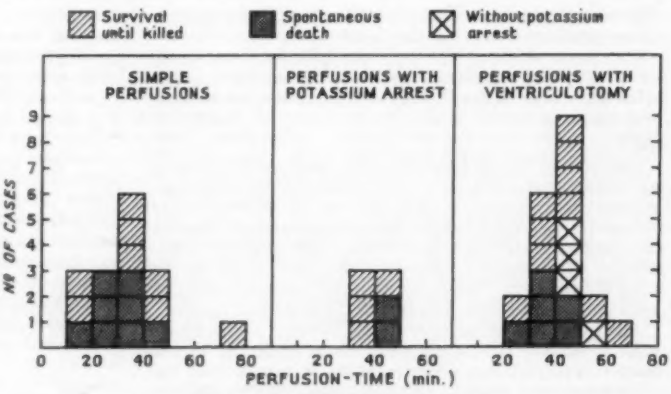

Fig. 3—Results of perfusion in dogs.

Note.—The 4 dogs undergoing ventriculotomy without potassium arrest all survived until killed.

Postoperative monitoring has not been employed. Though obviously informative in dogs whose postoperative progress is unsatisfactory, it would have been difficult to achieve in those dogs which recovered rapidly. These were so active that maintenance of the monitoring attachments would have required undesirable sedation or restraint. We have found it difficult at the end of the operation to foresee which dogs require further monitoring.

Recovery

Early in the series the dogs were watched overnight. Intermittent chest suction was applied and the dogs transfused as necessary. The chest tube was removed after eighteen hours. It was found that the most valuable prognostic sign of recovery was the ability of the dog to walk within 6 hours of the operation. (Of the twenty-six survivors, nineteen walked within 6 hours, and six of these walked within 1 hour of the last stitch being inserted (see table). Of the sixteen that died only six walked at all; and, of these, five lived more than 3 days.) In the later part of the series, only dogs which did not walk within 6 hours or whose chest drainage was excessive were watched overnight. The dogs returned to the kennels approximately 24 hours after operation and were seen at least once a day by a member of the team. Their care followed general surgical principles, and included the repair of wound dehiscence in three animals.

Results

We have performed forty-two total cardiac bypass operations on dogs in the last nine months (see table and fig. 3). No dog died during the operation, and only one dog (dog 6) failed to recover consciousness. Twenty-six animals survived until killed. In the first half of the series there were ten deaths, and in the second half there were six. Only two of the last thirteen dogs died.

Causes of Death

Postmortem examination, including histological studies, has been carried out on every dog. The causes of death fall mainly into two groups—those certainly due to perfusion, and those due to errors in surgical technique. It is of course possible that dogs which died after an obvious error in surgical technique might have died from the effects of perfusion.

Six dogs (dogs 6, 10, 13, 24, 35, 39) died from the effects of perfusion. Low flow-rate and duration of perfusion did not appear to be significant factors in these deaths. Three of these dogs (dogs 24, 35, 39) died in the mode described by Drew et al. (1957).

Dog 6 was the only dog that did not recover consciousness. It was breathing spontaneously, but the heart stopped when it was turned over 2 hours after operation. Histology of the liver showed gross fatty change, with no normal liver cells.

Dog 13 became comatose on the 2nd postoperative day and was found dead the next morning. At necropsy there was cerebral œdema.

Dog 10 was anæmic postoperatively and was transfused. On the 2nd day its hind limbs became weak, and it was found dead on the 4th day. At necropsy there was bilateral cerebral infarcts.

Those dogs which died from errors in surgical technique fall into several groups.

Dog 3 died from effects of inadequate hæmostasis.

Dogs 18, 19, and 20 died from overtransfusion in a mistaken attempt to restore the colour of the mucous membranes to normal after operation.

Dogs 7 and 16 had excessive bleeding from the chest after operation which was controlled by reopening the chest and coagulating the bleeding-vessels: both were overtransfused and died.

Dogs 28 and 29 died late from bilateral pneumothorax and from mismanaged empyema respectively. In both cases there was considerable muscle necrosis due to faulty diathermy technique.

Dogs 5 and 26 had pneumonia; dog 5 was killed at 5 days with a tentative diagnosis of distemper.

These errors in surgical technique have been largely eliminated; this probably accounts for the improved survival-rate in the later part of the series.

Conclusion

The improvement in the survival-rate in the second half of the series, and the fact that only two of the last thirteen dogs died, were considered evidence that the team had gained sufficient knowledge of total cardiac bypass to embark on open heart surgery in children with congenital heart-disease carrying a limited prognosis.

Summary

The experience of a team carrying out total cardiopulmonary bypass in dogs, using a Lillehei-deWall heart-lung machine, is described.

After three months' preparation forty-two total cardiopulmonary bypass procedures for periods of 10–75 minutes at flow-rates of up to 1500 ml. per min. have been performed during the last nine months. In twenty-eight dogs a further procedure—elective potassium arrest or ventriculotomy, or both—was performed.

There were sixteen deaths in the series, but only two deaths have occurred in the last thirteen experiments.

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REFERENCES

Arnott, W. M., Cumming, G., Davidson, P., Pincock, A. C. (1951) *J. Physiol.* **113**, 31P.
Dale, H. H., Laidlaw, P. P. (1911) *J. Path. Bact.* **16**, 351.
deWall, R. A., Warden, H. E., Varco, R. L., Lillehei, C. W. (1957) *Surg. Gynec. Obstet.* **104**, 699.
— — Lillehei, C. W. (1958) *in* Extracorporeal Circulation (edited by J. Garrott Allen). Oxford.
Drew, C. E., Cliffe, P., Scurr, C. F., Forrest, D. M., Pearce, D. J., King, P. A., Coles, H. M. T., Leveaux, V. M., Zilva, J. F. (1957) *Brit. med. J.* ii, 1325.
Hudson, W. A. (1958) *Proc. R. Soc. Med.* (in the press).
Kirklin, J. W., Donald, D. E., Harshbarger, H. G., Hetzel, P. S., Patrick, R. T., Swan, H. J. C., Wood, E. H. (1956) *Ann. Surg.* **144**, 2.
Lightwood, R. (1958*a*) Unpublished.
— (1958*b*) Unpublished.
Lillehei, C. W., deWall, R. A., Read, R. C., Warden, H. E., Varco, R. L. (1956) *Dis. Chest*, **29**, 1.
Melrose, D. G., Dreyer, B., Bentall, H. H., Baker, J. B. E. (1955) *Lancet*, ii, 21.
Macintosh, R. R., Pask, E. A. (1941) *ibid.* ii, 10.
Patrick, R. T., Theyre, R. A., Moffett, E. A. (1957) *Anesthesiology*, **18**, 5.
Perkins, H. A., Osborn, J. J., Hurt, R., Gerbode, F. (1956) *J. Lab. clin. Med.* **48**, 223.

Addendum

Since this laboratory study, we have operated on 5 children with ventricular septal defect, of whom 2 have died, and a child with tetralogy of Fallot who also died.

Preliminary Communications

THE MODIFICATION OF EGG-YOLK FATS BY SUNFLOWER-SEED OIL AND THE EFFECT OF SUCH YOLK FATS ON BLOOD-CHOLESTEROL LEVELS

SERUM-CHOLESTEROL in man may be lowered by removing fat from the diet, or by substituting certain vegetable oils, rich in unsaturated fatty acids, for the usual dietary fats.[1] Addition of fairly large amounts of vegetable fats to the ordinary diet has a similar effect, but disturbs the calorie balance and leads to a gain in weight.[2]

It occurred to us that the same purpose might be served if unsaturated fatty acids were added to the diets of hens, milch-cows, hogs, and beef cattle, and thus incorporated in the food these animals provide.

It is well known that the depot fats of hogs can be readily changed by diet.[3] In 1934 Miss Cruikshank appreciably altered the unsaturated-fatty-acid content of egg-yolk fats by feeding the hens linseed or hempseed oils.[4] While our own work was in progress, Fisher and Leveille [5] reported that 30% safflower oil increased the iodine number of egg-yolk fats from 74 to 103, and the linoleic-acid content from 8·9% to 18·4%. The unsaturated fatty acids were determined by the alkali isomerisation technique.

We report here the results of feeding 10% sunflower-seed oil (linoleic-acid content about 60%) to hens for an 8-week period. Eggs collected after 10 days on this diet were examined by Dr. A. T. James by the gas-liquid chromatographic method, and showed a sixfold increase in the di-unsaturated ^{18}C fatty acids which was almost entirely due to linoleic acid (see table). Their linolenic-acid content was low. The increase in linoleic acid was largely at the expense of the oleic acid, which declined by half.

FATTY ACIDS OF YOLK FATS

Name of acid	No. of carbon atoms	No. of double bonds	Control %	Experimental %
Probably branched ..	6	0	7·45	6·00
Caproic	6	0	0	0
Myristic	14	0	0·33	0·36
Palmitoleic	16	1	3·08	1·36
n-Hexadecanoic	16	0	26·7	21·80
Linoleic and linolenic ..	18	2 and 3	5·65	30·40
Oleic	18	1	46·9	28·00
Stearic	18	0	8·64	9·90
Arachidonic	20	4	1·28	2·54

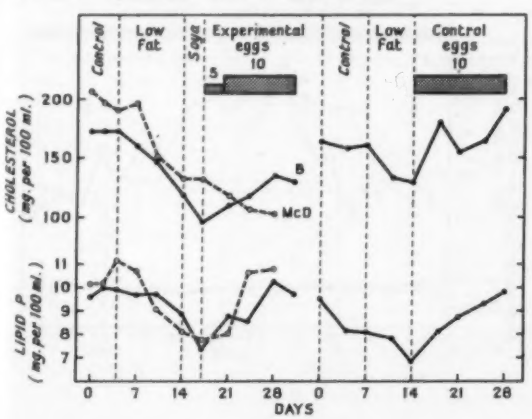
In a preliminary study, two subjects were given these " experimental " eggs (see figure).

First, three control blood samples were drawn while they took their normal diet. Then they were given a low-fat diet (4% of calories from fat) for 10 days. Next, soybean oil was added at 40% level for 2 days. Finally they received five experimental eggs daily for 3 days followed by ten daily for a further 11 days. The eggs were soft-boiled or poached, to avoid excessive heating or frying. Blood was drawn twice weekly for serum-lipid determinations. In both subjects the cholesterol levels fell substantially before the egg feeding started. In subject B they then rose gradually and stabilised at 130 mg. per 100 ml. (control level 172 mg.). In subject McD they continued to fall throughout the period of egg feeding. As lipid-phosphorus rose more rapidly than cholesterol, the C/P ratio remained low.

After a month, subject B was retested using stock eggs from the same source (" control " eggs). As can be seen, there was a rapid and substantial rise in the serum-cholesterol and lipid phosphorus. Because of illness, subject McD could not be retested.

These results suggest that hens' eggs containing un-

1. Horlick, L., Craig, B. M. *Lancet*, 1957, ii, p. 566.
2. Farquhar, J. W., Sokolow, M. *Circulation*, 1957, **16**, 494.
3. Hilditch, T. P. Chemical Constitution of Natural Fats; p. 104. London, 1956.
4. Cruikshank, E. M. *Biochem. J.* 1934, **28**, 965.
5. Fisher, H., Leveille, G. A. *J. Nutrition* 1957, **63**, 119.



saturated fatty acids in high concentration may be consumed without raising cholesterol levels above the " basal value " for the individual.* Our experience indicates that the basal values are about 30% below the levels ordinarily found in Western society. Perhaps modification of foodstuffs may enable us to achieve the blood-cholesterol levels now seen in populations which have low morbidity and mortality from atherosclerosis.

We are indebted to Dr. A. T. James, of the National Institute for Medical Research, Mill Hill, for the analytical data. One of us (L. H.) receives a grant from the National Research Council, Canada.

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SERUM-CHOLESTEROL LEVELS AFTER CONSUMING EGGS WITH INCREASED CONTENT OF UNSATURATED LIPIDS

THE rise in serum-cholesterol level which follows consumption of hens' eggs is something of an enigma. It is not due to their cholesterol or protein content,[1 2] and it is generally attributed to a fatty-acid factor. Egg-yolk lipids, however, are only moderately saturated (iodine value 70–80) [3]; and their cholesterogenic effect is greater than would be expected on the " degree of saturation " hypothesis of Ahrens et al.[4] Furthermore, egg-yolk lipids contain about 20% of linoleic acid [5] (in addition to 32% of saturated fatty acids, 47% of oleic acid, and 2% of linolenic acid) and thus their cholesterogenic effect cannot readily be explained in terms of the essential-fatty-acid deficiency postulated by Sinclair [6] and by Kinsell et al.[7]

While considering this we recalled an old report by Cruickshank,[5] who found that when hens were fed on a diet rich in hempseed, the linoleic-acid content of their yolk lipids rapidly rose from 19 to 44%, with a corresponding fall in saturated and oleic acids; at the same time, the iodine value of the yolk lipids rose from 80 to 120. Accordingly, in the hope of shedding some light on their cholesterogenic mechanism, we decided to compare the effects of ordinary and " unsaturated " hens' eggs on the human serum-cholesterol level.

A flock of Black Australorp hens was chosen for our experiments. During an initial 2-week control period they had a stock diet containing 3% of fat with an iodine value of 93. Eggs were collected on four occasions, and the iodine value of their yolk lipids averaged 72 (S.D. 1). Half the hens were then placed in a separate henhouse and were given a special feed which included sunflower seeds (80% dehulled). The other half continued with their ordinary diet. The composition of the control and the experimental feeds is shown in the table.

Percentage composition of the hen feeds

	Control feed	Experimental feed
Mealie meal	59·0	31·0
Bran	11·0	4·3
Lucerne meal	11·0	8·7
Peanut-oil cake	5·0	..
Fish meal	6·5	3·5
Limestone powder	2·0	3·5
'Fermavite' (molasses fermentation product)	1·0	2·5
'Premix' (commercial bone-meal and salt mixture)	4·5	3·5
Sunflower seeds (80% dehulled)	..	43·0
Percentage fat contents (by analysis)	3·0	15·0

From now on four eggs were gathered from each hen house weekly. The yolk lipids from the hens on the experimental feed showed a progressive increase in iodine value, and by the end of 3 weeks this had reached 100, at which level it remained for the duration of the experiment. The iodine value of the yolk lipids from the control hens did not change and at 3 weeks averaged 73 (standard deviation 1·5). At this stage all the eggs from the control and the experimental hens were collected and used for human feeding trials. The experimental egg yolks were a deeper yellow than the controls, but when they were cooked they could not be distinguished by taste.

The experimental hens throve on their diet, and their egg-production was in no way inferior to that of the controls. It interested us to find that, after the 6 weeks, the mean serum-cholesterol level of the ten experimental hens was 117 mg. per 100 ml. (S.D. 23), compared with 166 mg. (S.D. 34): these mean values were significantly different (P less than 0·02). By this time the body fats of the experimental hens had become relatively unsaturated: the values for the control and experimental hens respectively were: abdominal fat, 76 and 94; subcutaneous fat, 76 and 85; muscle fat, 77 and 91; liver fat, 77 and 90. Too few analyses were performed, however, to permit of any statistical comparison.

The effect of feeding these eggs was studied in 2 healthy Bantu male volunteers, each 34 years old. During the experiments they lived in the metabolism ward and received the basal diet, very low in fat (11 g. daily), which we have previously described.[8] Except as indicated below, their diets were kept constant with respect to calories (2500 daily) and protein (88 g. daily).

Experiment 1 (fig. 1).—On the basal diet, the mean serum-cholesterol level was 75 mg. per 100 ml. Introduction of ten boiled " control " egg-whites into the daily diet for 10 days did not alter it. When they were replaced by ten boiled control egg yolks daily for 10 days, it rose to 100 mg. These were then replaced by ten boiled " unsaturated " yolks, and during the next 10 days the serum-cholesterol level fell to 95 mg. per 100 ml.—a trivial change. In the next period, ten whole " unsaturated " eggs fried in 100 g. of sunflower-seed

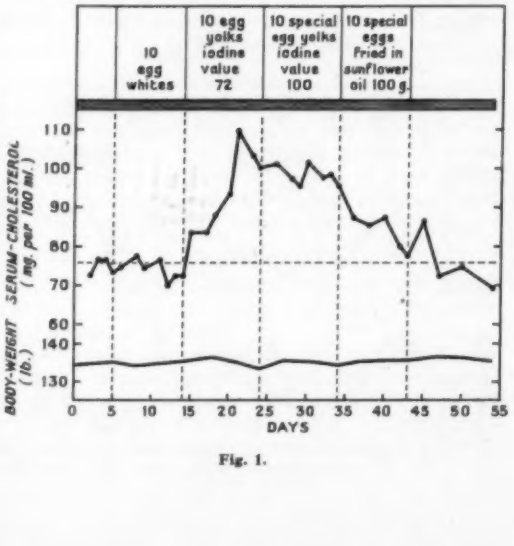

Fig. 1.

* Since this communication was first submitted, two more subjects have been tested. The ingestion of ten eggs daily (high in unsaturated fatty acids) resulted in a gradual return of the serum-cholesterol levels from low-fat basal levels to control levels in a 2-week test period. With stock eggs, the serum-cholesterol rose more abruptly and reached higher levels.

1. Messinger, W. J., Prosowska, Y., Steele, J. M. *Arch. intern. Med.* 1950, **86**, 189.
2. Bronte-Stewart, B., Antonis, A., Eales, L., Brock, J. F. *Lancet*, 1956, i, 521.
3. Deuel, H. J., Jr. The Lipids: Their Chemistry and Biochemistry; vol. 2. London, 1951.
4. Ahrens, E. H., Jr., Hirsch, J., Insull, W., Tsaltas, T. T., Blomstrand, R., Peterson, M. L. *Lancet*, 1957, i, 943.
5. Cruickshank, E. M. *Biochem. J.* 1934, **28**, 965.
6. Sinclair, H. M. *Lancet*, 1956, i, 381.
7. Kinsell, L. W., Michaels, G. D., Friskey, R. W., Splitter, S. *ibid.* 1958, i, 334.

oil were eaten daily (3100 calories, 112 g. protein), and by the 9th day the serum-cholesterol level fell to 77 mg.—i.e., practically to basal level. On returning the subject to his basal diet there was a temporary rise in the serum-cholesterol, but it quickly returned to the basal level.

In this first experiment there was no difference in the effect on the serum-cholesterol level of " control " and " unsaturated " eggs. It remained possible, however, that if the latter had been eaten for more than 10 days the cholesterogenic effect of the control eggs might have been reversed. In the next experiment, therefore, the unsaturated eggs were fed without a preliminary period on control eggs.

Experiment 2 (fig. 2).—During an initial 6-day basal period, the serum-cholesterol level averaged 188 mg. per 100 ml. Then ten boiled unsaturated egg yolks daily were introduced into the diet and fed for 7 days; the serum-cholesterol level promptly rose to 218 mg. The subject was then returned to his basal diet and 3 g. of cholesterol daily (i.e., the amount in ten yolks) was mixed with his food for the remaining 8 days of the experiment. The serum-cholesterol quickly returned to the basal level, and this showed again that the serum-cholesterol-increasing action of eggs is not due to their cholesterol content.

It appears from these two experiments that increase of the iodine value of egg yolks from 72 to 100 does not materially affect their cholesterogenic action. Although egg-yolk lipids with iodine value of 100 markedly raise the serum-cholesterol level, we have frequently observed that certain other more saturated fats, such as hydrogenated sunflower seed oil (iodine value 74), do not raise the serum-cholesterol, and that some, such as olive oil (iodine value 88) and peanut oil (iodine value 89), sometimes lower it. Thus we conclude that the effect of all dietary fats on the serum-cholesterol level is not simply a function of their degree of saturation.

The suggestion of Keys et al.[8]—that, to offset the cholesterogenic effect of saturated fatty acids, at least twice as much polyethenoid fatty acid is required—might appear to be a satisfactory explanation of our findings; thus, the additional linoleic acid introduced into the unsaturated eggs may not have sufficed to neutralise their saturated-fatty-acid content. In Cruickshank's experiments,[5] the polyethenoid-fatty-acid content of her unsaturated eggs was more than double their saturated-fatty-acid content; had we been able to " unsaturate " our eggs beyond iodine value 100, it is conceivable that we might have produced a " cholesterol-decreasing " egg. It must be noted, however, that in several other dietary experiments in man, a fall in serum-cholesterol has been produced with far less than a 2 : 1 ratio of polyethenoid to saturated fatty acids. For example, fig. 8 of our paper last December,[9] shows that the cholesterogenic effect of 100 g. of hydrogenated coconut oil (almost all saturated fatty acids) was abolished by 100 g. of sunflower-seed oil—i.e., by only 65 g. of linoleic acid. In a number of long-term studies of active men consuming their ordinary diets, which were often rich in saturated fats, we found that by simply administering 50 g. of sunflower-seed oil (about 33 g. of linoleic acid) daily, a substantial decrease in the serum-cholesterol level was usually produced and maintained.[10] It may be that the rule of Keys et al.[8] is valid when applied to their type of " group " experiment but we agree with Kinsell [11] that the *individual* response to a dietary fat is variable and cannot be predicted by a mathematical formula.

8. Keys, A., Anderson, J. T., Grande, F. *ibid.* p. 742.

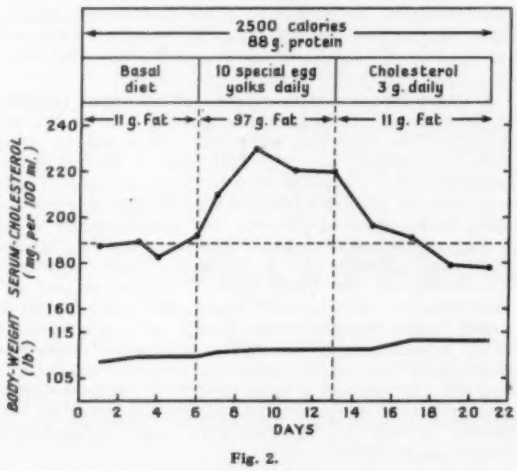

Fig. 2.

We have no data on the individual fatty-acid components of our control and unsaturated egg yolks, but on the basis of Cruickshank's findings [5] we have assumed that the unsaturation of the latter is achieved by an increase in the proportion of linoleic acid at the expense of the monoethenoid and saturated fatty acids. Failure of this presumed rise in the linoleic-acid content of our eggs to inhibit the cholesterogenic effect seems to be at variance with the " essential fatty acid deficiency " hypothesis. We must point out, however, that it is not known whether the " linoleic acid " of egg yolks is the biologically active *cis-cis* isomer or not. It is known that the " linoleic acid " of a number of animal fats is in the inactive form,[12] isomerisation apparently having taken place in the process of digestion, absorption, or deposition of the active linoleic acid of the diet. Thus, Hilditch and Longenecker [13] found that, despite an abundance of natural linoleic acid in pasture grasses, the depot fats of ruminants contain very little of it; most of the octadecadienoic acids of these fats are in the *trans-cis* or other isomeric forms. It is possible that the failure of our unsaturated egg yolks to decrease the serum-cholesterol level is due to isomerisation of the linoleic acid of the dietary sunflower seeds in the course of its incorporation into the egg yolk.

The above speculation implies acceptance of the " essential fatty acid deficiency " hypothesis. This hypothesis, however, is far from proven: hypercholesterolæmia does not occur in animals fed on a diet deficient in essential fatty acids,[14] nor is there any direct evidence of such deficiency in hypercholesterolæmic human beings. It is true that Kinsell et al.[7] have shown that 95% pure linoleic acid can lower the serum-cholesterol level of man, but the effect of its " non-essential " isomers has not been studied. We must conclude that the factor or factors in dietary fats which regulate the serum-cholesterol level are still unknown.

These experiments were performed with the cooperation of Dr. M. Finlayson, the owner, and Mr. J. Mirvish, the manager, of the farm Kelvin Grove in the Constantia valley. We are grateful to them for their kindness.

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9. Gordon, H., Lewis, B., Eales, L., Brock, J. F. *ibid.* 1957, ii, 1299.
10. Gordon, H., Brock, J. F. *S. Afr. med. J.* 1958, **32**, 397.
11. Kinsell, L. W. *Lancet*, 1958, i, 857.
12. Hilditch, T. P. Chemical Constitution of Natural Fats. London, 1956.
13. Hilditch, T. P., Longenecker, H. E. *Biochem. J.* 1937, **31**, 1805.
14. Deuel, H. J., Jr., Alfin-Slater, R. B., Wells, A. F., Kryder, G. D., Aftergood, L. *J. Nutr.* 1955, **55**, 337.

Reviews of Books

Clinical Biochemical Methods

A. L. TÁRNOKY, B.SC., PH.D., biochemist, Royal Berkshire Hospital, Reading. London: Hilger & Watts. 1958. Pp. 239. 50*s*.

MOST departments of clinical biochemistry or chemical pathology have a "methods book", which contains, usually in alphabetical order, descriptions of the techniques used in the department. These are concise résumés but leave out no essential detail. The junior technicians use this collection of recipes rather as a young housewife would her cookery book, and the more senior members of the laboratory refer to it for a quick refresher. To be entered in such a laboratory book is high praise for a technique because it implies that it has been tested by the worker on the bench, found reliable and worthy of becoming a part of his everyday routine. There is a tendency to adhere to one particular method once it has been accepted and not to bother about minor or sometimes even major improvements: the accent is on reliability and convenience rather than on striving to be entirely up to date. Dr. Tárnoky's book is such a one, describing "the biochemical analyses in routine use in the laboratory of the Royal Berkshire Hospital".

Most methods required in clinical biochemistry are here assembled, but the natural history of such a summary of techniques explains why the choice is somewhat uneven. Thus the method for estimating serum-calcium is the old-fashioned precipitation of the calcium as oxalate and the subsequent titration of the oxalate by permanganate. On the other hand, serum-chloride is determined by the swift titration with mercuric nitrate with diphenylcarbazone as the indicator. Serum electrophoresis for separating protein fractions is described; but no mention is made of the determination of urinary aminoacids and sugars by chromatography, or of the instantaneous identification of glucose in urine by the use of test papers or sticks containing glucose oxidase. The urine tests are somewhat neglected. Sulkowitch's test for calcium and Bial's test for pentoses (though the osazone test is mentioned) might have been included. No test for fructose in urine is given. It might be questioned whether anyone can describe satisfactorily the determination of the basal metabolic rate, of alkali reserve, of serum-protein fractions by electrophoresis within a few pages each. Yet as far as he can go Dr. Tárnoky has produced here masterpieces of concise clarity. This book will be particularly useful in hospital laboratories which do not include a biochemical department and where a morbid anatomist must take responsibility for the reliable biochemical investigation of hospital patients.

A History of Public Health

GEORGE ROSEN, M.D., PH.D., M.P.H., professor of health education, School of Public Health and Administrative Medicine, Columbia University. New York: M.D. Publications. 1958. Pp. 551. $5.75.

THE history of public health is the story of man's endeavours to protect himself and his community against disease and of the attitudes of society towards the sick throughout history. In primitive communities, down to the Middle Ages, society's defence against sickness, physical or mental, was to isolate or destroy the patient; later came the endeavour to heal the sick and so prevent them from infecting or harming their fellow men or becoming a burden on society; and finally the establishment of positive protection of the healthy from the dangers of disease.

Professor Rosen has long been recognised as one of the world's foremost medical historians and an acknowledged leader in matters of public health. Here, in the first of a new series of monographs on medical history, his pen has skilfully traced the procession of men, deeds, and facts that have taken a vital part in the story of public health, and the tremendous tasks that had to be faced.

As late as 1808 the inhabitants of Exeter emptied their sewage in the gutters, and in the entire town there was only one water-closet. The introduction of this amenity, however, soon created more problems than it solved, since the cesspits were cleaned out very rarely and the contents seeped into the soil, saturating the ground over large areas and polluting springs and wells. It was deceptively easy to dispose of sewage by allowing it to discharge into the sewers that existed under many cities by this time; but they were solely designed to carry off rainwater, and so, as the practice became more general, rivers and lakes in or near all the larger towns were turned into open sewers. This was to be one of the major problems facing the sanitary reformers of the nineteenth century.

The book is well documented and contains an appendix of short biographies.

Heart Disease and Pregnancy

Physiology and Management. C. SIDNEY BURWELL, M.D., Samuel A. Levine professor of medicine, Harvard University; JAMES METCALFE, M.D., associate in medicine, Harvard University. Boston: Little, Brown & Co. London: J. & A. Churchill. 1958. Pp. 338. 72*s*.

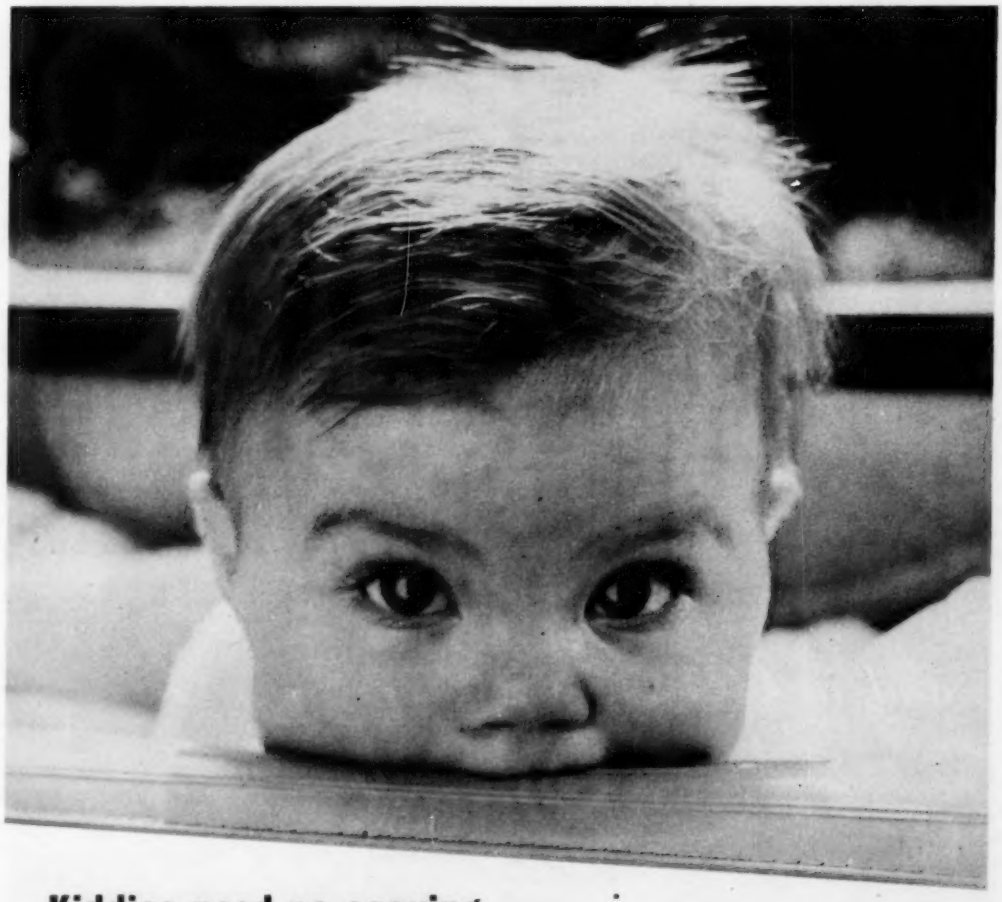
THIS work is based on the authors' experiences in the Boston Lying-In Hospital. It begins with a brief historical survey showing the dramatic fall in maternal mortality from heart-disease in the hospital between 1921 and 1927, and a further decline in 1937–39. There follows a full account, well illustrated by graphs, of the physiological maternal changes in pregnancy. Other chapters deal with the incidence of heart-disease among pregnant women; diagnostic criteria for heart-disease; prognosis; maternal and fœtal mortality; and the management of the pregnant patient with heart-disease, with special reference to the indications for termination of pregnancy. A chapter is devoted to rheumatic fever in pregnancy, and the remainder of the book covers the problems of pregnancy in different forms of congenital and acquired heart-disease. Particular attention has been paid to mitral stenosis and the question of valvotomy in pregnancy. The concluding chapters cover less common types of heart-disease and neurocirculatory asthenia. This book will undoubtedly prove of great value to physicians, obstetricians, and cardiologists, its great merit being the emphasis on the extensive personal experience of the authors.

Hypnography

AINSLIE MEARES, M.B., D.P.M. Springfield, Ill.: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957. Pp. 271. 58*s*. 6*d*.

Dr. Meares has for some years done pioneer work in the field of hypno-analysis, and this clinical study, well written and thoughtfully presented, will interest any psychotherapist aware of the value of hypnosis. A description of the preliminaries to hypnosis, the methods of inducing hypnosis, and the technique for hypnography itself leads to an account of the kind of material produced. The patient, hypnotised while sitting at a desk, is given a brush and black paint and it is suggested that he shall paint whatever is in his mind. The drawings thus produced are illustrated in a series of over 200 figures, and their dynamic content discussed, both in general terms and specifically in excerpts from case-histories. The book might have been less expensive if some of the figures had not been duplicated.

A Short History of the Order of St. John (London: St. John Ambulance Brigade Headquarters. 1958. Pp. 83. 2*s*. 6*d*.).—The black and white uniforms of the St. John Ambulance Brigade are a familiar sight at all our public functions. But few realise that the men and women who wear them are lineal descendants of the knights of one of the oldest known orders of chivalry. And many members of the Brigade would themselves find it hard to say how long ago the Order was founded, or how its present functions have evolved. This booklet by Mr. E. D. Renwick sets out in easy and attractive style a story which begins in the twelfth century in Amalfi, a small republic south of Naples, and which continues to the present day; for the eight-pointed white cross, once the badge of that republic, is still the emblem of the Order of St. John. The account is freely illustrated. All those doctors who have been associated with the Brigade would do well to read it; they may well feel, after its perusal, that their stature has increased.



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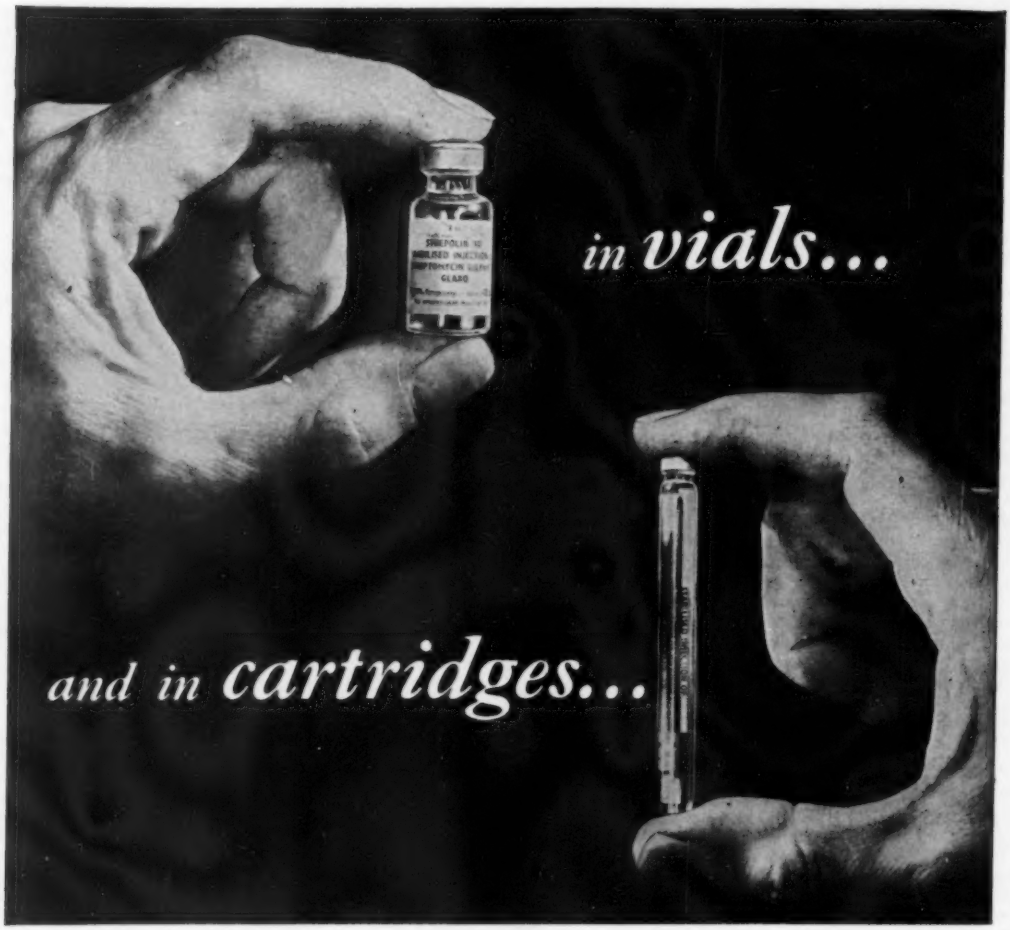

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THE LANCET
LONDON 2 AUGUST 1958

Another Renal Symposium

IN medical literature the post-war scene (as we hopefully call it) has been dominated by the multiple-author textbook and the conference report. This multiplication of opinion between the same covers reflects progress in the application of several disciplines and habits of mind to a single group of problems, rather than an escape from monolithic authority into a confusion of experimental facts; and as such it is to be welcomed, even though it may make for bitty reading. The kidney has been well served by such publications, including in this country the Ciba symposium in 1953,[1] the Cushny memorial lectures,[2] and the issue of the *British Medical Bulletin* on renal physiology and pathology.[3] An important series of "seminars" on renal physiology appeared in the *American Journal of Medicine* in 1950; and now, following the changing fashion in nomenclature, we have in the same journal a "symposium on renal function"[4]—though it may be doubted whether the first series of papers was delivered to small discussion groups, or the second at a drinking-party. The renal outsider may perhaps wonder what new thing can be said on this theme; but he has only to look into this most recent symposium to discover, with the active nephrophile,[5] that these are exciting times in which our knowledge of that marvellous organ, the kidney, is being added to in many ways.

In their preface, G. H. MUDGE and J. V. TAGGART, the editors, draw attention to four "areas" in which "considerable progress is apparent". These are "the morphology and cellular fine structure of the nephron, concepts in the clinical appraisal of renal disorders, descriptive electrolyte physiology, and the cellular mechanisms which operate in renal tubular transport". Each of these "areas" seems to us perhaps to represent part of a larger whole, which might be summarised as a shift of emphasis towards tubular function and away from glomerular function and renal plasma-flow. It is scarcely possible to overestimate the contribution made to renal physiology and pathology by the clearance techniques of HOMER SMITH; but there was a period about a decade ago when a superficial observer might have thought that the kidneys were of importance mainly in excreting substances such as inulin and *p*-aminohippurate (P.A.H.), which they never normally encounter, rather than in regulating the output of physiological constituents of the urine. To be sure, the limits of action of change in glomerular filtration-rate (G.F.R.) on urine formation had to be defined, and it cannot be denied even now that fall in G.F.R. is a major factor both in "extrarenal uræmia" and in some types of generalised œdema; but the attempt to make changes in G.F.R. responsible for any alteration in salt balance has failed. This failure is currently recognised in the term "glomerular-tubular imbalance", which is perhaps best regarded as an unhappy symbol of a transition period in applied renal physiology. Progress is now coming from the application of new techniques and new thinking to the very varied functions of the renal tubule. As examples of this we may mention the detailed study of the processes by which the urine is made acid, stemming from the work of PITTS and his colleagues [6]; the application of DENT's technique of paper chromatography to define the "clinical patterns of tubular dysfunction", now reviewed by MUDGE [7]; the use of histochemistry [8] and of nephron dissection [9] in localising functional and structural lesions of the tubule; and of course the description of the effects of aldosterone and other hormones on the tubular handling of electrolytes.

New approaches to tubule function are well represented in the latest symposium. PITTS [10] reviews the information on the site of action of various diuretics which is being obtained in his department by the "stop-flow" method—an ingenious technique in which the urine flow in dogs is arrested for a few minutes, after which continuous frequent samples are taken from the ureter. At high rates of urine flow, stimulated by mannitol, successive samples of urine differ in composition in a way suggesting that they represent the fluid in successive segments of the nephron up to and including Bowman's space. Analysis of twenty to thirty such samples in each experiment gives results consistent with a distal-tubule site of action of acetazolamide, but with a predominantly proximal-tubule action of the mercurial diuretic chlormerodrin. MILNE and his colleagues [11] describe how differential permeability of membranes leads to a concentration of weak bases in acidic fluids and of weak acids in alkaline fluids; this concept is important not only in relation to ammonium excretion but also in the pharmacology of important agents such as salicylate, mecamylamine, and pempidine.[12] Dilution and concentration of the urine, so often taken for granted or used as an empirical test of renal failure, are now reviewed in worthy detail by BERLINER et al.,[13] who propose a modification of the ingenious but somewhat neglected "counter-current" physical mechanism of WIRZ.[14] Some new thinking is certainly needed here to account for such apparent anomalies as the failure of water diuresis in hypopituitarism,[15] the inability of healthy people to form a concentrated urine for some days after a period of water-loading,[16] and the formation

1. The Kidney (edited by A. A. G. Lewis and G. E. W. Wolstenholme). London, 1954.
2. Winton, F. R. Modern Views on the Secretion of Urine. London, 1956.
3. *Brit. med. Bull.* 1957, **13**, no. 1.
4. *Amer. J. Med.* 1958, **24**, 659.
5. Platt, R. *Brit. med. J.* 1952, i, 1372.
6. Pitts, R. F., Alexander, R. S. *Amer. J. Physiol.* 1945, **144**, 239.
7. Mudge, G. H. *Amer. J. Med.* 1958, **24**, 785.
8. Pearse, A. G. E., Macpherson, C. R. *J. Path. Bact.* 1958, **75**, 69.
9. Oliver, J., MacDowell, M., Welt, L. G., Holliday, M. A., Hollander, W., Winters, R. W., Williams, T. F., Segar, W. E. *J. exp. Med.* 1957, **106**, 503.
10. Pitts, R. F. *Amer. J. Med.* 1958, **24**, 745.
11. Milne, M. D., Scribner, B. H., Crawford, M. A. *ibid.* p. 709.
12. Harington, M., Kincaid-Smith, P., Milne, M. D. *Lancet*, July 5, 1958, p. 6.
13. Berliner, R. W., Levinsky, N. G., Davidson, D. G., Eden, M. *Amer. J. Med.* 1958, **24**, 730.
14. Wirz, H., Hargitay, B., Kuhn, W. *Helv. physiol. pharmacol. acta*, 1951, **9**, 196. Wirz, H. Proceedings of the 8th Symposium of the Colston Research Society. London, 1957.
15. Oleesky, S., Stanbury, S. W. *Lancet*, 1951, ii, 664.
16. de Wardener, H. E. Communication to Medical Research Society, 1957. Epstein, F. H., Kleeman, C. R. Hendrikx, A. *J. clin. Invest.* 1957, **36**, 629.

of a concentrated urine in the absence of antidiuretic hormone when G.F.R. is reduced.[17] TAGGART [18] reviews progress in the very difficult problem of active tubular transport. Much of this progress has been negative, in the elimination of "mechanisms proposed in the past on rather superficial grounds"; but his account of glucose reabsorption and of P.A.H. secretion indicates at least the way in which the application of metabolic energy to active transport is likely to be elucidated.

In addition to the emphasis on tubular function, the papers in this symposium illustrate another way in which renal physiology is drifting away from the dominance of clearance techniques. The first two papers, on electron microscopy [19] and on renal biopsy,[20] reflect the renewed interest in structure as a necessary basis for function. These two papers are a partial fulfilment of some of the hopes expressed by JEAN OLIVER in his contribution to the 1950 series, entitled "an essay toward a dynamic morphology of the mammalian nephron".[21] Perhaps fortuitously, another paper in the present series, by BRADLEY and WHEELER,[22] stresses the differences between nephrons, in contrast to their statistical unity which is the unstated assumption of the clearance approach—an assumption which was pilloried by OLIVER in the trenchant query: "When is a kidney not a kidney?".[23] So far from being uniform, the nephrons are apparently "notably multifarious, in dimensions, mass, configuration, construction and arrangement"; the evidence of a functional counterpart to these obvious variations in structure is still indirect, but it is increasing in cogency, even for the normal kidney.

Looking at the symposium in general, it is apparent that the questions are still well ahead of the answers; but at least they are different questions, and perhaps in the long run more easily answered. Most of the advances reported have been in physiology, and have not yet been digested into practical clinical use; but the work on diuretics,[10] on renal biopsy,[20] and on the kidney in potassium depletion [24] is already at this stage. Most of the territory, in which we have planted a few signposts, lies between the desert and the sown; and it is not yet certain whether some of the concepts expressed will turn out to be words ("the daughters of earth") or things—"the sons of Heaven" in the round Johnsonian phrase.

The Right Background

THE part that physical environment plays in the treatment of physical illness has long been appreciated: fresh air, sunshine, particular kinds of food, and exercise—all are recognised as often therapeutic. Today we are beginning to appreciate the equal importance of mental environment in the treatment of mental illness, and this rediscovery is helping to change the atmosphere of mental hospitals. In the past, as Dr. DUNCAN MACMILLAN pointed out last week,[1] the environment of these places has too often not even been neutral: it has been actively unhelpful. Certification, deprivation of civil rights, segregation from the rest of the community, and confinement behind locked doors are procedures which, however well intentioned, can only increase the tension, uncertainty, and bewilderment of the patient and aggravate the disturbance of his mind and feelings.

But environment can do more than fail to hinder recovery. It can actively speed the patient's progress; and today the hospital environment is no longer regarded as a mere custodial background—against which active therapy flamed and then too often faded—but as part of the patient's treatment. The clearer this becomes, the more important it is that he should be placed in the most suitable environment; and this in turn demands a subtler classification of patients according to their needs and a greater diversity of hospital accommodation. Unlike many reforms, this may prove an economy as well as an advance. Professor MCKEOWN and his colleagues [2] in their survey of 3555 residents in Birmingham mental hospitals found that only 13% needed the full range of hospital facilities; 75% needed only limited hospital services; and 12% needed none of the traditional ones. MCKEOWN thinks that in the hospitals of the future these three different kinds of patients should be in separate units.

Ways in which the hospital unit can be varied according to the patient's need have also been discussed by Dr. MINSKI, drawing on his experience as physician and superintendent of a neurosis centre from 1938 to 1957.[3] In his view the ideal administrative framework for the care of mental patients would comprise a neurosis hospital, an acute psychiatric hospital, and a hospital for long-stay patients—all under the same management committee, and with the same senior doctors working in all three. In this way the task of looking after the chronic cases would be shared between the medical staff. He suggested that registrars coming fresh from general medicine should begin their psychiatry in the neurosis centre, where they would find patients of a kind already familiar to them. He would like to see some beds in general hospitals reserved for neurotic and psychosomatic cases so that medical and nursing staff should have more experience of looking after these patients. Observation wards should also, in his view, be attached to general rather than mental hospitals, for many of the patients admitted to these beds would then never need to go to a mental hospital. But if in this way the general hospital could usefully take part in the care of the mental patient it should in return have help in its outpatient department. To give the necessary continuity of care, a psychiatrist from the complementary mental hospital should be on the staff of the outpatient department of the general hospital.

Dr. MINSKI has described his ideal, albeit an ideal

17. Berliner, R. W., Davidson, D. G. *J. clin. Invest.* 1957, **36**, 1416.
18. Taggart, J. V. *Amer. J. Med.* 1958, **24**, 774.
19. Rhodin, J. *ibid.* p. 661.
20. Brun, C., Raaschou, F. *ibid.* p. 676.
21. Oliver, J. *ibid.* 1950, **9**, 88.
22. Bradley, S. E., Wheeler, H. O. *ibid.* 1958, **24**, 692.
23. Oliver, J. *J. Urol.* 1950, **63**, 373.
24. Relman, A. S., Schwartz, W. B. *Amer. J. Med.* 1958, **24**, 764.

1. Macmillan, D. *Lancet*, July 26, 1958, p. 201.
2. Garrat, F. N., Lowe, C. R., McKeown, T. *ibid.* 1958, i, 682.
3. Minski, L., in a paper read to the Royal Medico-Psychological Association on Feb 22, 1958.

formed by experience. Dr. BAKER on p. 253 describes a reality in which progress, if not perfection, is being achieved by improvisation. Like Professor MCKEOWN and Dr. MINSKI, he asks for the division of our huge monolithic mental hospitals into smaller, livelier, friendlier units, and he describes how, at Banstead Hospital, a modest start has already been made. A non-statutory unit and a tuberculous unit have already been opened, and in defiance of structural difficulties the 1200-bed institution is to be divided up and transformed, if all goes well, into three admission hospitals, a geriatric hospital, a hostel, and a reablement unit. Dr. BAKER believes that if we made better use of our hospital beds we should not need so many of them. The Banstead experiment in functional division is a brave effort to free psychiatric practice from the domination of what he justly describes as our " huge overpopulated unwieldy mental hospitals ".

Annotations

TREATMENT OF THE PSYCHOPATH

SOME of the most obstinate problems in psychiatry revolve round the clinical condition known as " psychopathic personality ". The very concept is so hard to delimit and so open to argument that the Royal Commission on the Law Relating to Mental Illness and Mental Deficiency, while advocating wide compulsory powers, left the definition open.[1] But the diagnosis is child's play compared with the difficulties of management; and the remarks on treatment by Dr. Melitta Schmideberg, chairman of the Association for the Psychiatric Treatment of Offenders, in a lecture to the Institute for the Study and Treatment of Delinquency on July 23 were of great interest.

Drawing on her experience in Europe and the United States, Dr. Schmideberg pointed out that the usual criterion of psychopathy was antisocial behaviour, but this did not necessarily involve breaking the law. The narcissistic element was pronounced, and this love of self with slight regard for others led to a peculiar idea of reality in which the future consequences of present actions could not be judged: the capacity to learn from experience was similarly one-sided, and, while the psychopath's errors seemed to make him more adept in criminality, punishment was not often deterrent. Ideas of grandeur and " magical " modes of thinking seemed to be involved in his usual belief that he could not be caught. Although the whole life-pattern showed self-destructive tendencies, suicide among psychopaths was rare: the borderline between psychopathy and schizophrenia was sometimes vague and could be crossed in either direction. There was always a strong wish for pleasure, and a need for immediate gratification, but the capacity for enjoyment was slight. Although anxiety and guilt were said to be characteristically absent, Dr. Schmideberg was sure that they existed but were denied: indeed antisocial acts often arose as an expression of anxiety. The sadistic element was clear enough in the various aggressive acts, and, as Dr. Peter Scott pointed out in the discussion, masochistic traits in some cases made punishment worse than useless since this was just what the patient unconsciously sought.

As to the origins of the condition, Dr. Schmideberg, for a psychoanalyst, laid surprisingly little emphasis on trauma in early life. Maternal deprivation was but one factor. She pointed out that increasing numbers of psychopaths in America come from well-ordered middle-class homes; similarly there were deprived slum children in whom psychopathic traits did not develop. The development of social ideals and self-control was what socialised, and it was in this area that the psychopath was most disturbed. The prevalence of crime was greatest not in towns like New York and Chicago but in affluent areas such as California. She felt that American ideals were becoming increasingly psychopathic; crime bred crime, and vivid newspaper reporting had much to answer for. (It could be added to her list of external causes that tough police methods constitute a " challenge " to delinquents which may have much to do with the extreme violence of some American adolescent outbursts.)

Dr. Schmideberg believed that treatment out of prison was often preferable, since only in society could the patient face his relationship problems in the work and sexual sphere. The difficulty was that the severe psychopath did not *want* to change: his sole interest in doctors was in using them to get out of trouble. For this reason interpretations of behaviour given during psychotherapy would probably be used by the patient as an excuse for further offences and a means of putting the blame for his behaviour on to others (e.g., his parents). Analytic treatment must be employed with caution, and the defences against real insight were enormous. Success could be hoped for in reluctant patients only when they were obliged under threat of punishment to receive treatment; thus probation and suspended sentences were, in Dr. Schmideberg's view, invaluable. Some doctors disliked the idea of their patients being " forced " to receive treatment from them, but it was the unwilling ones who required attention most urgently. The art of the therapist consists in turning the enforced relationship into a genuine one, and it was mainly this genuine relationship that socialised the patient. Under the suspended sentence, the sentence was postponed and finally pronounced after periodic appearances in court and reports from the therapist. This and probation, she considered, were admirable devices, which provided just the right blending of authority with threat from the court and support from the therapist. The initial relationship came most easily just before the trial, and she used challenging and directive methods related to real-life situations concerning the patient's actions and their consequences. The process of producing motivation was half the problem, and, once the patient wished to change, the process became one of re-education. One criterion of success was stability at work, for if a man was not in work he would steal. Adjustment was always hard, because the psychopath expected disproportionate praise for anything he did. Dr. Schmideberg departed again from analytic practice in that she verified incidents and progress by means of information from the family, employer, and probation officer if it could be tactfully obtained without hurting the patient.

Dr. Maxwell Jones rightly indicated in the discussion that relationships in the work and sexual spheres could be built up in certain kinds of institution, and that commentary and prohibition might be more effective to the

1. Royal Commission on the Law Relating to Mental Illness and Mental Deficiency, 1954–57; paras 190–195, 357. H.M. Stationery Office, 1957.

patient when derived from his peers instead of from authority. Many will differ from Dr. Schmideberg's views and methods, but their particular virtues seem to be their realism and common sense. It is to people with her energy and positive approach that we look for new ideas and methods—the trouble is that methods already in use remain somewhat unknown quantities. Apart from the work at Belmont,[2] Simpson has an interesting unit at Wormwood Scrubs,[3] and elsewhere different types of formal psychotherapy and psychoanalysis have been used. Everyone working in or observing these endeavours must agree that "things happen" (treating psychopaths may be trying but it is certainly not uneventful), and the dynamic situations that arise are of much scientific interest. But the ultimate results are hard to judge, and comparison of one kind of management with another is impossible.

WHY PEOPLE SMOKE

TEMPERAMENTAL differences between smokers and non-smokers have been described by Heath [4]; and now McArthur et al.[5] have published further observations on the same group of men. Their subjects were 252 Harvard graduates who, while at the university in 1938–42, were selected for a study of adult development because of their apparent normality. They were examined by psychological and various other techniques, and their progress was checked by annual questionaries, tests, and visits. Smoking habits were among the extensive data collected about these men, and information accumulated over a fifteen-year period was available for analysis.

Believing with Bales [6] that the social and cultural environment is the most potent influence on habit formation, McArthur et al. considered that non-smoking was likely to be commonest in the lower middle class of the U.S.A., since there is evidence [7 8] that people of this rank, more than those above or below them in the social scale, still cleave to values derived from what has been called the Protestant Ethic [9]—religious doctrine according to which it is sinful to waste time and substance on unprofitable activities. Children reared in this tradition are taught to eschew frivolity, and to be upright, industrious, and ambitious.[6 10 11] It seemed probable, therefore, that members of the middle class would be less likely to indulge in a pleasure of the flesh, such as smoking, than members of other less ascetic sections of the population. In order to test this hypothesis they compared the smoking habits of men who had prepared for Harvard at public high schools with those of men who had prepared for Harvard at private preparatory schools, as the high-school graduates were mainly of middle-class and the preparatory-school graduates of upper-class origin. They found, in fact, that there was a highly significant correlation between smoking and exclusiveness of school. 20% of the graduates of very exclusive private schools, 30% of the graduates of less exclusive private schools, and 40% of the graduates of public schools did not smoke. At first sight it might appear that a public-school education is less conducive to smoking than a private-school one; but this is not so, for it has been estimated [12] that only 9% of boys at American public schools do not smoke! It must therefore have been from this select minority that the Harvard public-school non-smokers were recruited. They were predominantly earnest young men of the middle class, the pride of their families, heavily indoctrinated with "work morality", and bent on achieving the status of a technical or professional career. The upper-class private-school boys, on the other hand, aimed rather at conformity with an accepted code of behaviour than at advancement through self-denial, and most of them went into business. A significantly high proportion of non-smokers had pious parents, and the sons were often more pious than the fathers. In short, it would appear from the findings of this investigation that a comparatively poor but very honest Protestant, keen to "improve himself", is more likely than most in America to remain a non-smoker; and McArthur et al. quote a market survey carried out in England [13] which suggests that here also non-smoking is associated with "middle class respectability".

Whatever the reason for starting to smoke, it may be assumed that the degree of addiction will be determined by the extent to which the habit satisfies the personal needs of the smoker. It is generally believed that smoking is indulged in to allay anxiety, but McArthur et al. found no convincing evidence of a general tendency in their subjects to smoke more heavily in times of stress, although they admit that their experiment was not ideally designed to test this point. However, as 70% of heavy smokers and only 30% of light smokers said they smoked more when under pressure, it seemed possible that smoking may become a suitable tension reducer only when it has become a deeply ingrained habit. Heavy smoking in their study was found to be most significantly correlated with a "coartated" performance of a special Rorschach test—that is, a record indicative of a lack of emotional resources. Coartated men were "inarticulate, pragmatic, and bland . . . hard to get to know . . . compulsive fiddlers, desk-arrangers, people who allayed their tension through fussy activities". Once a coartated person started to smoke he tended to smoke heavily, no matter what his social background had been. Moreover, he tended to smoke increasingly, so that if he started late he was soon smoking more than men who had started early. Among the heavy smokers who were not coartated there was, as Heath [4] has already observed, a significantly high proportion of impulsive men with poorly integrated personalities.

As regards ability to stop smoking, the amount of tobacco previously consumed was found to be the most significant factor. It was estimated that men who have smoked a mean number of 9 cigarettes a day can stop, men who have smoked 18 do not try, and men who have smoked 20 cannot. (Presumably it is assumed that some 18-a-day men can stop if they try.) The ability of the subjects of the study to stop smoking was also significantly related to the length of time they had been breast-fed. Light smokers who could stop had been weaned at 8 months; heavy smokers who could stop had been weaned at 6·8 months; smokers, mostly heavy, who did not try to stop had been weaned at 5 months; and smokers, mostly heavy, who tried to stop but could not had been weaned at 4·7 months. McArthur et al. do not suggest that there is an immediate connection between early

2. Jones, M., et al. Social Psychiatry. Tavistock Publ. London, 1952.
3. Landers, J. J., McPhail, D. S., Simpson, R. C. *J. ment. Sci.* 1954, **100**, 953.
4. Heath, C. W. *Arch. intern. Med.* 1958, **101**, 377. See *Lancet*, 1958, i, 680.
5. McArthur, C., Waldron, E., Dickinson, J. *J. abnorm. soc. Psychol.* 1958, **56**, 267.
6. Bales, R. F. *Quart. J. Stud. Alcohol*, 1946, **6**, 480.
7. McArthur, C. *Harvard educ. Rev.* 1954, **24**, 256.
8. McArthur, C. *J. abnorm. soc. Psychol.* 1955, **50**, 247.
9. Weber, M. The Protestant Ethic (Translated by Talcott Parsons). New York, 1930.
10. McClelland, D., Rindlisbacher, A., De Charms, R. Studies in Motivation; p. 389. New York, 1955.
11. Miller, D. C., Form, W. H. Industrial Sociology. New York, 1951.
12. Hollingshead, A. Elmtown's Youth. New York, 1949.
13. Davis, F. Unpublished.

weaning and inability to stop smoking—the time of weaning may reflect only a certain pattern of infant training—but they point out that smoking is associated with a liking for other oral gratifications: smokers tend to drink more alcohol and coffee than non-smokers,[4] and if they stop smoking they are apt to substitute food for tobacco.[14] Also, a lower than average proportion of men who could stop smoking had been bottle-fed babies, and a higher than average proportion of men who could not were reported to have sucked their thumbs in childhood. McArthur et al. therefore conclude that, although the amount of tobacco previously consumed is of prime importance in determining whether or not a person can stop smoking, an " orality " factor may also be influential.

Perhaps the most interesting finding of this study is that in the past some parents, on general principles, have persuaded their children not to smoke. Now that the perils of cigarette smoking are so widely known, it would be even more interesting to learn what parents are managing to persuade their children to avoid the habit on the specific ground that it is dangerous to life.

ANTIBODY TO PENICILLIN

Ley et al.[15] have reported a new and interesting observation—that specific antibody to penicillin may be demonstrated in some human sera. The discovery was made accidentally. Penicillin was added as a routine to preserve red-cell suspensions used in a blood bank. The serum of one prospective recipient of a transfusion was found to agglutinate all red cells against which it was tested, but the agglutination did not appear when the same serum was tested against red cells which had not been mixed with penicillin. When the patient's red cells were treated with penicillin, they also were agglutinated by his own serum. Investigation showed that red cells of all human blood-groups could be made agglutinable to antibody-containing sera in this way, but so far only with the penicillins G, O, and K, and the penicillin derivative synnematin B. Results were negative in tests with streptomycin, dihydrostreptomycin, polymyxin B, bacitracin, neomycin B, ristocetin, viomycin, and oleandomycin; but it is not stated whether cells sensitised with these agents were put against sera likely to contain antibody to them or only against sera known to contain antibody to penicillin. Penicillin inactivated by penicillinase did not sensitise the red cells; but red cells once sensitised could not be desensitised by subsequent treatment with penicillinase, papain, or ficin. Sensitisation of red cells with penicillin proceeded in proportion to the concentration of the drug and time of exposure, reaching a maximum in about twenty-four hours and persisting for as long as the cells remained useful for testing—that is, for some two to three weeks.

To carry out tests for serum antibody, Ley et al. prepared penicillinised red cells by adding 8 ml. of a mixture of equal parts of whole blood and Alsever's solution to 200,000 units of powdered penicillin G. After incubation at 37°C for an hour the red cells were washed thrice in physiological saline solution and made up to a suitable suspension (4–10%) in physiological saline. The incubation temperature was not critical, since sensitisation could be accomplished at any point in the range 6–37°C. Antibody was eluted from sensitised cells by heating them at 54°C for fifteen minutes; the antibody was stable at refrigerator temperatures and resisted 56°C for two hours. Its possession of many of the known attributes of a true antibody, and its specificity, thus appear to be well established; further, it may be completely adsorbed from sera by their exposure to concentrations of penicillin of the order of 12,000 units per ml. or greater. A positive reaction between antibody-containing serum and sensitised red cells may be easily demonstrated by conventional slide or tube agglutination methods if there is enough antibody, and by anti-globulin methods if there is not. So far, Ley et al. have detected 25 positive sera among about 2000 tested. All who yielded positively reacting sera had received penicillin treatment at some time, but only a minority had been known on clinical grounds to be sensitive to penicillin.

This report is of great interest both because it offers a possible method of studying the sensitisation of patients to penicillin—an important problem in its own right—and because, despite the negative results with other antibiotics so far tested, this report raises the hope that the valuable method of red-cell agglutination may perhaps, with appropriate technique, be yet found adaptable to the study of other hypersensitivity phenomena, which cause so much distress to their victims and appear to be an increasing feature of medical practice.

EXPERIMENTAL MONILIASIS

MONILIASIS is attracting attention because overgrowth of the causal agent, *Candida* (formerly *Monilia*) *albicans*, is commonly observed in patients treated with antibiotics—particularly, it seems, with broad-spectrum antibiotics such as chloramphenicol and the tetracyclines. Usually this overgrowth is without clinical significance; but exceptions are common enough to maintain our interest in the influences that may favour or counteract invasion of tissue by *C. albicans*. Studies of these problems are reviewed by O'Grady and Thompson,[1] who describe their own experimental approach, which has novel and notable features.

To begin with, they chose to work with a lesion produced by inoculating *C. albicans* into the left thigh of mice. This was done to eliminate the uncontrollable and unmeasurable effects that might arise in experiments where a local bacterial flora was normally present. It is suspected that, in actual practice, monilial overgrowth may be due partly to suppression of normal flora; but the unresolved question which was studied was whether an antibiotic might have a more direct effect either on the growth of the candida or on the defences of the host. The closed lesion in the thigh of the mouse met this point. Furthermore, objective, accurate, rapid, and frequent measurements of the progress of the experimental infection could be made by measuring daily with sliding callipers the mediolateral diameters of the thighs and thence calculating the average increase compared with the normal thigh. O'Grady and Thompson examined Seligmann's [2] postulate that chlortetracycline (aureomycin) exerts on the response of the host to candida infection an effect analogous to that of cortisone. In the effects of cortisone and chlortetracycline they discovered, by their approach, two similarities and two differences. Both drugs caused a decrease in size of the experimental lesions, which was followed by a rapid increase when treatment was stopped. In addition, if the dose of chlortetracycline was high enough, the diameter of the thigh on the side

14. Brozek, J., Keys, A. *Science*, 1957, **125**, 1203.
15. Ley, A. B., Harris, J. P., Brinkley, M., Liles, B., Jack, J. A., Cahan, A. *ibid.*, 1958, **127**, 1118.

1. O'Grady, F., Thompson, R. E. M. *Brit. J. Pharmacol.* 1958, **13**, 1.
2. Seligmann, E. *Proc. Soc. exp. Biol., N.Y.* 1952, **79**, 481 1953, **83**, 778.

of the lesion continued to be above the control value, as with cortisone—a demonstration of the rebound effect, already well known with cortisone.

Intramuscular injection of cortisone alone reduced the diameter of the thigh a little, and injection of cortisone along with candida reduced the candida lesion compared with untreated controls. Chlortetracycline by itself, on the other hand, produced a large swelling, and if given along with candida produced a very large and persistent mass. When the drugs were given subcutaneously to animals which received the candida separately, the suppression and rebound resulting from cortisone could not be reproduced by subcutaneously administered chlortetracycline in any dosage. On the contrary, the reduction in size of the lesion from subcutaneously administered chlortetracycline became increasingly long-continued with increased dosage, but rebound was not observed even when the chlortetracycline was given for two days only. From other experiments, which involved the use of many substances which might conceivably have imitated the main effects of cortisone and chlortetracycline, it became clear that the action of aspirin in this infection did not resemble that of cortisone or chlortetracycline and that chlortetracycline was not acting as a simple irritant, however important its irritant action undoubtedly was in enhancing the lesions when it was given along with *C. albicans*.

O'Grady and Thompson have certainly given us something interesting to ponder, even if neither they nor we can be quite certain of what it all means in terms of clinical medicine.

ADOLESCENCE

THE consequences of human polymorphism in development-rate have lately been underlined once again by Tanner.[1] By carrying out one of the first really large studies that included longitudinal as well as cross-sectional observations [2] Tanner has shown the extent of this polymorphism, which is seriously obscured if events at puberty are pictured from cross-sectional averages. There is a large diversity in the patterns of change and the rates at which they occur over the period from 9 to 16 years of age: by plotting the time of occurrence and range of onset of the spurts of fat deposition, height gain, genital development, and muscular strength, it can be seen that "an early-maturing boy may have finished his entire adolescence before a late-maturing boy of the same chronological age has even begun his first enlargement of the testis". This diversity—which is obvious from general experience once it has been pointed out, but for which astoundingly little allowance is made—has important educational implications. Tanner also draws attention to the likelihood of psychological effects associated with late or early development in a given social setting. The early developer may be precocious and popular (or alternatively precocious and embarrassed); the late may become despondent over his sexual or athletic inadequacies. None of these will be constant effects—in different social settings they may operate to produce opposite results—but there seems little doubt that rate of development may be a more important determinant of personality than has generally been conceded. Since, moreover, early or late puberty are likely, on animal evidence, to be heritable, possibly one should seek here the supposed "genetic" bases of various personality characters—homosexuality or excessive shyness, for example, which show twin and sib correlations.

Tanner's work is a shining example of the realisation of human polymorphism—of the number of different "normalities"—which human biology is contributing to medicine. The follow-up of these series into adult life will contribute still more. It would be interesting to know, for example, whether rate of development and rate of senescence are positively linked, or negatively as in hybrid vigour, where hybrid animals both develop faster and live longer than inbred.

1. Physical Maturing and Behaviour at Adolescence. By J. M. TANNER, M.D., D.SC., D.P.M. Published by the National Children's Home, Highbury Park, London, N.5. 1958. Pp. 46. 2s. 6d.
2. See Tanner, J. M. Growth at Adolescence. Oxford, 1955.

THE RUSSIAN VACCINE

UNCERTAINTY about the Russian vaccine which has been used in the treatment of multiple sclerosis[1–3] is lessened by a letter in last week's *British Medical Journal*. Writing from Moscow, Professor Shubladze and Professor Dick say that it is necessary to reinvestigate and characterise the original isolates of the SV strain of acute encephalomyelitis virus from which the vaccine of Shubladze and Margulis was prepared, because recent experiments have shown that the SV strain in current use is similar to rabies virus. Further recommendation about treatment with the vaccine cannot, they add, be made until these new inquiries have been completed. Dick and his colleagues in Belfast had earlier reported [4] results suggesting that the virus was rabies virus; and it is welcome news that Professor Shubladze and Professor Dick have been able, by personal discussion, to throw light on a confused situation.

LIFE PEERS

THE traditions and institutions that survive longest are those that can assimilate and accept change with grace and realism, and for some time it has been apparent that the House of Lords was remaining dangerously unchanged in a changing world. The reform now being undertaken is a further breach in the hereditary principle. Already the Law Lords sit as life peers, and the Bishops only while they hold their sees; and now the number of life peerages is to be gradually raised, so that the House shall contain more members willing and able to devote a good deal of time to its business. We are glad to note that the list of fourteen new life peers announced last week contains the names of two doctors.

Sir John Stopford, as a past vice-chancellor of the University of Manchester, a fellow of the Royal Society, and an emeritus professor of experimental neurology, has the background of an administrator and a scientist. Dr. Stephen Taylor has already had some taste of politics as M.P. for Barnet from 1945 to 1950. Since then, to his war-time experience as the director of Home Intelligence and the War-time Social Survey, he has had added the knowledge of social medicine he has gathered from his special studies, on behalf of the Nuffield Provincial Hospitals Trust, of general practice and of the health service. He is also director of the industrial health service of the new town of Harlow, in whose development he has played no small part.

1. See *Lancet*, 1958, i, 730.
2. Liversedge, L. A. *ibid.* p. 1224.
3. McCluskie, J. A. W., Timburg, G. C. *ibid.* p. 1386.
4. Dick, G. W. A., McKeown, F., Wilson, D. C. *Brit. med. J.* 1958, i, 7.

Sir CLEMENT PRICE THOMAS has been elected president of the Welsh National School of Medicine.

Professor A. M. CLAYE has been re-elected president of the Royal College of Obstetricians and Gynæcologists.

Special Articles

BREAKING UP THE MENTAL HOSPITAL

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DEPUTY PHYSICIAN-SUPERINTENDENT, BANSTEAD HOSPITAL, SUTTON, SURREY

THREE years ago, Banstead Hospital housed 2450 patients, and there was a waiting-list. There are now some 2000 patients in the hospital and no waiting-list. Yet, during these years the annual number of admissions has risen by 40%, and the hospital's catchment area has grown, adding some 40,000 people to the population which it covers.

REFORMS AND RESULTS

These changes are largely due to our interpretation of the new outlook on the duties and responsibilities of the mental hospital.

We have assumed that all patients entering hospital come for treatment and expect to return to their homes. Therefore, every admission, however apparently hopeless the prognosis, has had active treatment and rehabilitation, whether he was a new patient, a readmission, or a geriatric patient. The only exceptions have been patients with a progressive organic dementia.

All admissions have been treated in fairly small wards, all of them open, with maximum privileges.

Instead of admitting all disturbed women patients to one ward as in 1955, we now admit them to four wards. One ward is reserved for the physically ill; the allocation of patients to the other three wards is determined partly by age and partly by diagnosis.

We have been in touch with relatives, friends, and employers, and asked them to ensure that a place in the community is kept open for the patient.

Physical treatment, particularly E.C.T. and the tranquillisers, is used extensively, not only to alleviate symptoms, but also to enable the patient to make full use of the therapeutic social activities we offer him.

We have started many social and occupational activities, of which the small factory within the hospital itself was one.

The nursing staff have, of course, played a large part in the changes. Two maxims have been of the greatest importance. The nurses have been encouraged to treat the patients on the understanding that " their patient today may be their neighbour tomorrow ". Secondly, it was made clear to them that when a long-stay patient was made fit to resume life outside hospital, his place in the overcrowded ward would not be taken by another. Thus the nurses knew that success in their efforts to help a patient would mean an improvement in conditions. The old policy by which vacancies on long-stay wards were filled with more disturbed patients from elsewhere discouraged the nurses.

In 1955, not only were the wards overcrowded, but they were too big. Among twenty-six wards on the women's side we had seven with over 100 beds in each. As a result of our discharges and some rearrangement, no ward now has more than 60 beds, though this is still twice as many as we should like.

Another result of our discharge policy has been the development of our outpatient service, for we had to provide supervision and further treatment for more patients. Our outpatient clinics have all expanded—some as much as sixfold in the last three years.

PLANS AND PROPOSALS

One of the biggest problems in our present mental hospitals is their size. During the Victorian era when they were built, the policy was to provide custodial care and to house as many patients as possible as cheaply and conveniently as possible. The large barnlike wards therefore accommodated at least 100 patients, and each of the large prison-like hospitals held 2000–3000. We have made some progress in reducing the number of patients in a ward, but the 2000-bed mental hospital is much too large, however small the individual wards become. It cannot possibly form a " social field ", in Lewin's sense, in which each individual influences the whole, and the whole influences each individual. No doctor or nurse can possibly know all the patients, and each person in the hospital inevitably feels relatively insignificant. We should aim at hospitals of 200–300 beds. Since these hospitals cannot at present be built, we have started to try to break up our present colossus into smaller, more manageable units. For example, we have now a 100-bed non-statutory unit which was originally built as an admission ward, and also a 100-bed unit for tuberculous men which serves the South West Metropolitan region. But we are still left with the main mass of the hospital, which on the women's side means 1200 patients shared between twenty-five wards.

There seems no obvious way of breaking up our ward blocks structurally, but we propose to divide them functionally, so that each unit provides a complete hospital service of its own. These hospitals within a hospital will each be run by a doctor who will be responsible for treatment and transfers within the unit. Each will have its own " matron " and nurses and ancillary workers.

We plan to break up our 1200-bed unit into three admission hospitals, each with 200 beds, a geriatric hospital with 300 beds, a hostel for patients working in the hospital industries, with 250 beds, and rehabilitation unit with 50 beds.

The three admission hospitals would be the *geriatric* unit (with 1 admission ward, 1 convalescent ward, and 2 wards for patients whose physical health is deteriorating and whose discharge is unlikely); a unit for *young, disturbed patients* usually with schizophrenia (with 1 admission ward and 3 wards providing graduated social training and rehabilitation); a similar unit for *middle-aged patients* of roughly forty to sixty.

Part of the proposed geriatric hospital already houses the most frail or physically ill of our long-stay senile population. In view of the present demand for geriatric beds and our ageing long-stay population we propose to bring the number of beds up to 300 so as to provide an adequate geriatric service for the long-stay wards in the hospital.

As many of our patients, though employable and needing practically no supervision, have not been able to find a suitable niche in the community, we provide accommodation for them within the hospital and this unit will become the proposed hostel. From these wards the patients go out in the morning to work in our factory projects or to do hospital domestic work. They eat in the hospital's self-service cafeteria. They take part in the social opportunities of the hospital and of the local community.

The small rehabilitation unit will be used for the active rehabilitation of patients from the long-stay wards who are planning to leave hospital in the near future. It will enable them to concentrate on their social problems, and when they move into this ward we shall be able to see their capacity to adjust to a new situation. As we are extremely short of social workers, the nurses on this ward will probably perform some of their duties.

DISCUSSION

When an unwieldy hospital is broken into smaller units, group and community techniques become feasible, morale improves, and patients and staff develop a greater sense of purpose and a clearer idea of their function in the therapeutic community. But to obtain the best results each doctor should be in charge of a unit for not less than a year and preferably longer. Under our present system, where the units are formed by segregating patients according to age or length of stay, doctors tend to have a restricted experience of inpatient psychiatry. The benefits of our proposals are most obvious to the junior nursing staff, but they will exact a considerable change in attitude and function among the senior nurses, who have usually been trained for a different system of organisation and who can feel, justifiably, that much of their training and experience is now set aside, while fresh demands are made upon them.

So far as we have been able to progress with our scheme, there seems no doubt that the patients benefit by it. They have continuity of treatment and human relationships. Their problems are no longer "lost" by transfer from one therapeutic group to another. Under our scheme all parts of the hospital will have positive functions instead of merely providing beds.

It should be made clear that the provision of hostel accommodation and sheltered workshops is *not* the proper function of a mental hospital. These facilities should be in the community, and, though they need some psychiatric supervision, they should be run by the local authority. Though many of our patients using our hostel and workshop have made an excellent social adjustment, it is an adjustment within hospital and their prospects of discharge are now lessened rather than increased, for the community outside can offer no improvement in their way of life.

We expect the number of patients in the hospital to continue to fall at the rate of 100 a year, but this reduction could be greatly speeded if the local authority provided adequate aftercare services. A hospital of 300–500 beds would probably suffice for the treatment and hospital care of the patients we are at present admitting. Unless we are aware of this possibility and encourage the changes in attitude, both in the hospital and in the community, which will be necessary to achieve it, huge overpopulated unwieldy mental hospitals will continue to dominate psychiatric practice and absorb an increasing proportion of the health services expenditure.

THE BRITISH DIET

IN 1956 in this country the transition to a free market was almost complete, and the National Food Survey Committee's report [1] for that year is their first to record household diets under trading conditions similar to those prevailing before the war.

Comparing 1956 with 1934–39, the biggest change is an increase of 37% in milk consumption. Meat consumption is up by 3%, but fish is down by 16%. A decline of 37% in butter is almost completely offset by an increase in margarine. Cereals are down by 8%, but potatoes are up by 16%. Fruit and vegetables are almost unchanged. The nutrients available from these supplies show few significant changes. Daily intake of calcium per head has gone up by from 688 to 1107 mg. per day, derived partly from the extra milk and partly from artificial addition to bread. Total calories have increased from 3000 to 3140 per day, protein from 80 to 83 g. per day, and fat from 130 to 138 g. per day. (These figures take no account of the distribution of the food or of the inevitable losses in the wholesale and retail trade.)

In 1956 the National Food Survey recorded the diets consumed in 9617 households involving 31,063 persons.

The households were chosen to give a statistically valid sample of different social classes and of different parts of the country. Special attention was paid to the income of the householder and to the proportion of the income spent on food; but the surveys do not cover food eaten outside the home, in restaurants and canteens.

In all economic classes the average daily intake of all the nutrients is satisfactory as judged by the B.M.A. Nutrition Committee's recommendations. Differences between the social classes still exist, but these are much smaller than in the pre-war years, when at least 10% of the population were not getting a sufficiency of essential nutrient. The figures show that no large section of the community are underfed, judged by modern physiological standards. But, as the data collected covered less than 1 in 1000 of the population they do not exclude the possibility that a minority numbered in tens of thousands may still not be getting a physiologically adequate diet.

Households dependent on old-age pensions and those with four or more children are the most likely to be underfed.

In 1956, 245 households dependent on pensions and with an average total weekly income of less than £6 10s. were surveyed. The average expenditure per person in these households was 27*s.* 10*d.* The average physiological value of the diets consumed was satisfactory and this indicates that the majority of old people were getting enough to eat.

The number of families with four or more children surveyed was 236. Again the average intake of nutrients was satisfactory, but the numbers—especially in the lowest economic group—were small. It is recorded that the average weekly expenditure on food by an adult couple increased between 1952 and 1956 from 57*s.* 3*d.* to 72*s.* 9*d.*, whereas the regression estimate of extra expenditure for each additional child rose from 8*s.* 6*d.* to 8*s.* 10*d.* a week in the same period. From these figures it seems reasonable to conclude that solitary couples have been able to keep up their usual food customs despite the inflationary period, whereas large families must have had to make considerable economies. Yet there is no evidence that these economies have reduced the intake of nutrients below physiological standards.

A large section of the survey has been devoted to geographical differences in the household diets.

These differences seem of little or no public-health importance, though no doubt they will be keenly studied by the market-research investigators and may even divert a general reader. The Welsh spent more money on butter than anyone else but much less on eggs than the national average. In Scotland they spent much more money on cakes and biscuits, but less on fresh green vegetables than the average. Londoners appear to have spent most on vegetables, fruit, and milk, and, despite the higher prices, to have consumed more. The Midlands top the list easily for expenditure on cheese. The North and Yorkshire are right at the top in expenditure on flour, suet, and dripping, and this seems to be the region to go to for home-made cakes. The long table recording these differences deserves study by any family contemplating a holiday in lodgings and undecided where to go. But on turning to the table where everything has been reduced to calories, carbohydrates, vitamins and the rest, the local interest has disappeared and uniformity at a satisfactory level is presented.

A detailed appendix sets out quantitatively the different foods which are the source of fat in households of different

1. Domestic Food Consumption and Expenditure: 1956. Annual report of the National Food Survey Committee. H.M. Stationery Office. 1958. Pp. 172. 9*s.* 6*d.*

economic class, in different geographical regions, and in relation to the number of children. This has been provided for the help of those epidemiologists who are looking for relationships between the nature of the dietary fat and the incidence of coronary-artery disease. The uniformity in the total quantity of fat consumed is striking, though (as already stated) the Welsh take much more in the form of butter. The intake of vegetable fat is also remarkably constant (20 to 25 g. per day) at all social levels; but there is a small increase in the average intake of animal fat (from 77 to 95 g. per day) in the higher economic groups. At first sight little of importance appears to have come to light in this analysis, and the committee themselves present little comment. The working out of the correlations, if any, between these figures and corresponding data for mortality-rates is a task for the vital statisticians.

The committee have now published records of our national diet covering the years from 1940 to 1956. Their reports are admirable summaries of the country's food intake and it is highly desirable that their surveys should continue. Perhaps, however, some variation in scope would be valuable. The committee seem so far to have concentrated on attempting to survey systematically all classes all over the country. It might be worth limiting such surveys to every third year, concentrating in the intervening years on one of the groups in which households may be especially liable not to get enough satisfactory food. Old-age pensioners and families with a large number of children are two such groups. Though they were surveyed in 1956, the numbers were too small to justify the assumption that all was well with their food-supply.

Public Health

Regrouping of Water-suppliers

IN 1956 the Minister of Housing and Local Government called on water-suppliers to regroup themselves into larger and more efficient units.[1] Since then the number of undertakings in England and Wales has been reduced by 33 to 993 at the end of June. In addition, two compulsory orders and thirteen agreed orders, which together would reduce the undertakings by a further 36, were then awaiting the Minister's confirmation; the Minister had announced his intention of making three more compulsory orders, affecting 22 undertakings; and four private Bills were before Parliament.

The Minister has now called for speeding of regrouping,[2] saying that he will not hesitate to use his compulsory powers if suppliers cannot reach agreement among themselves.

Second Quarter in England and Wales

The birth-rate in England and Wales in the June quarter was high and the infant death-rate low.[3]

Live births numbered 189,159, a rate of 16·9 per 1000 population, the highest rate for a June quarter since 1949 when the rate was 17·6. Deaths numbered 124,113, a rate of 11·1 per 1000 population. The rates in the June quarters of 1957 and 1956 were 10·6 and 10·8 respectively. Deaths of children under one year of age totalled 4030, giving a record low rate for a June quarter of 21·3 per 1000 live births. The previous lowest for this quarter was 22·3 last year. In 1938 the corresponding figure was 50·3.

Anti-fly Campaign

An anti-fly campaign was held in Canterbury from July 14 to 19. The campaign included posters, the use of a loudspeaker car that toured the streets, and a competition for the best-kept dustbins. The schoolchildren were awarded prizes for the best short essays on What I Think We Should Do About Flies.

1. See *Lancet*, 1956, ii, 728.
2. Circular 4/58.
3. The Registrar General's Weekly Return no. 29, 1958. H.M. Stationery Office. Pp. 20. 1*s*. 6*d*.

Conferences

ANÆMIA AND THE ALIMENTARY TRACT

LAST week the Royal College of Physicians held the first of its new college conferences, with 117 participants, of whom 21 were invited speakers. Prof. ROBERT PLATT, the president, explained that the programme had been arranged by Prof. L. J. Witts, Prof. J. V. Dacie, and Dr. F. Avery Jones, and that the speakers had been selected from among those who are actively extending knowledge of anæmia in its relation to the alimentary canal. Chairmen at the sessions were the President, Dr. T. C. Hunt, Professor Witts, and Dr. T. L. Hardy.

The Mouth and Œsophagus

Dr. RICHARD ASHER (London) pointed out that the tongue is to some degree an index of the state of the rest of the alimentary tract, especially in sprue. Glossitis indicates that there is something wrong, but gives little clue to what it is; for atrophy occurs both in iron-deficiency anæmia and in pernicious anæmia, though in the latter the tongue usually appears glazed and glossitis precedes the anæmia, whereas in iron deficiency there are changes in the lips and angular stomatitis. There is doubt whether the atrophic changes in iron deficiency are due to the iron deficiency; for deficiency in any of the vitamin-B group may be followed by papillary atrophy and then by iron deficiency, while the lesions can be cured with riboflavine or with iron.

Dr. Asher recalled that A. B. Kelly and D. R. Patterson gave a full description of dysphagia associated with iron deficiency and a tendency to carcinoma of the œsophagus no less than three years before the inadequate description given by Vinson and the private communication of Plummer.

Dr. WILFRED SIRCUS (Edinburgh) discussed aphthous stomatitis and the syndromes of Behçet, Reiter, and Stevens-Johnson. About 20% of the population suffer sometimes from aphthous stomatitis—females twice as often as males—and nearly a fifth of the sufferers have attacks so frequent as to be virtually continuous. These ulcers can become confluent and cause severe scarring. Lesions occur on the genitalia in half the female but only 2% of male sufferers. The pathology is non-specific, but an inquiry showed that two-thirds of patients with malabsorption states had previously had severe aphthous ulceration; while 70% of sufferers from aphthous stomatitis suffered from severe anxiety states or emotional conflicts and nearly 60% were depressed. The ætiology is uncertain, but a metabolic or autoimmune process now seems more likely than a virus infection.

Behçet's syndrome is indistinguishable except that it involves the conjunctivæ and vagina: oral ulcers may precede the other lesions by several years. Recurrent herpes tends to die out as the patient gets older: Reiter's disease associates oral ulceration with urethritis and conjunctivitis. Oral pemphigus is painless but leaves lacy scars, and epidermolysis bullosa is rare. The Stevens-Johnson syndrome when fully developed has a generalised rash, with ulceration of face, mouth, conjunctivæ, and genitalia; but sometimes the lesions may be less extensive; if confined to the mouth, a macular rash develops vesicles which in 5–6 hours fuse to form bullæ, then burst and form serpiginous infected ulcers with a necrotic base and a hæmorrhagic margin.

Dr. T. D. KELLOCK (London) discussed œsophageal lesions, pointing out that in the "Plummer-Vinson" (Kelly-Patterson) syndrome the anæmia seems to cause the lesion, whereas in hiatus hernia the lesion causes the anæmia. In the Kelly-Patterson syndrome complete restoration to normal health is unusual (4 of 26 cases), the web remaining. Rare cases of œsophageal web without anæmia or dysphagia have been seen, and it may be that the web formation is a congenital lesion and not, as hitherto thought, a consequence of iron deficiency. However, 3 male patients have developed the syndrome apparently from chronic bleeding at the suture line of a gastroenterostomy, and these may be the heralds of an epidemic of this syndrome due in 15 or 20 years as a consequence of the many gastrectomies performed nowadays. Among patients with hiatus hernia, anæmia is common only in the rolling (55%) or combined (28%) types. Peptic ulceration of the œsophagus is rare, and occurs exclusively in heterotopic mucosa; the commonest objective finding is anæmia.

In the discussion it was brought out that smooth tips to the tongue may be considered normal and that new methods of tongue biopsy may help. The absence of a control series of housewives without aphthous ulcers was criticised and the excellent results of treatment with hydrocortisone emphasised.

The Stomach

Prof. H. A. MAGNUS (London) described the histopathology of the stomach in pernicious anæmia. By the time death occurs there is severe atrophy of all coats of the stomach, often with replacement of the body mucosa by intestinal epithelium and always without any evidence of inflammation. However, now that the changes can be observed during life by using Wood's gastric biopsy tube, the picture has changed. Only 40% of patients show complete atrophy, 35% show severe atrophic gastritis, 16% atrophic gastritis of less advanced degree, and 9% severe gastritis with atrophy but survival of a variable proportion of chief and parietal cells, even after pernicious anæmia had been present for several years. He concluded that there is a progressive inflammatory atrophic gastritis, and that this ultimately leads to complete gastric atrophy; the inflammation need not be exogenous. Such stomach changes are not confined to pernicious anæmia, but if a patient with such changes lives long enough he will probably develop pernicious anæmia. He also thought that a genetic nature is suggested by the history of the 20 cases of the juvenile pernicious anæmia.

Dr. MARGOT SHINER (London) described Wood's gastric biopsy tube and the intestinal biopsy tube. The procedure is not entirely devoid of the risk of hæmatemesis (3%) but has never caused anxiety for the patient's life. In the stomach she differentiated between gastric atrophy and atrophic gastritis of varying degrees; and in the intestine she noted varying degrees of villous atrophy with hyperplasia of the glands of Lieberkühn. Idiopathic steatorrhœa and cœliac disease display severe villous atrophy irreversible on treatment, whereas in tropical sprue and most cases of postoperative steatorrhœa the villi do regenerate when the patient is effectively treated. In pernicious anæmia and in iron-deficiency anæmia the intestinal mucosa is normal; but stomach mucosa is atrophic, or atrophic gastritis is present, in all patients with pernicious anæmia, in 54% of those with iron deficiency, and in many patients with idiopathic steatorrhœa. These results seem compatible with the hypothesis that pernicious anæmia is the final result of a genetically determined progressive atrophy of the chief cells of the gastric mucosa, while cœliac disease and idiopathic steatorrhœa result from an analogous atrophy of the crypt cells of the intestinal mucosa.

Dr. R. O. K. SCHADE (Newcastle) described his technique of gastric lavage for the diagnosis of carcinoma of the stomach by exfoliative cytology. The best results are obtained in early cases because after ulceration the cytological details are often obscured by debris. In four years, 30 cases were diagnosed by this method when other methods failed, and in 13 the tumour was microscopic and had not started to invade. Several patients had a small carcinoma as well as a peptic ulcer.

In the discussion the general opinion was that exfoliative cytology of the stomach seems justified in any patient with unexplained gastric disturbances, and that although false positives may occur this procedure is the only one which can detect early cases of gastric carcinoma. The cost of such tests on a large population was considered, but Dr. SCHADE thought that it need not be excessive.

It became clear that the recent work on megaloblastic anæmias has left some confusion about the best definition of pernicious anæmia in modern language. Dr. SHEILA CALLENDER (Oxford) said that in cases of pernicious anæmia there was evidence that one parent or the other had latent or expressed pernicious anæmia, and Professor MAGNUS suggested that the disease be defined as a megaloblastic anæmia occurring in a subject with a congenital chemical defect causing a progressive gastric lesion which normally continues to complete atrophy.

Investigation of Gastric Secretion

Dr. K. B. TAYLOR (Oxford) described the simplest indirect methods of measuring gastric secretion—the 'Diagnex' tests of gastric acid production, which can be done without passing a gastric tube, and the estimation of uropepsinogen excretion.

Neither the quininium nor the azure A diagnex resins give complete correspondence with the histamine test meal. Pyloroduodenal obstruction, syndromes of small-intestinal malabsorption and hurry, gastric operations, and disease of the urinary tract may affect the results, and gastric stimulation with caffeine sodium benzoate may be inadequate. Even when these possible sources of error have been excluded, false positive and negative results occur. The latter are unimportant, provided they are always checked by a subsequent maximal histamine test meal, but false positives are unsatisfactory. In this respect the quininium test is better than the azure A, and the positive error is only 5%, which makes it a useful screening procedure in clinical diagnosis, where a finding of achlorhydria suggests pernicious anæmia or gastric carcinoma (or both) and excludes duodenal ulcer, and a finding of free acid excludes pernicious anæmia. In research the test is valuable in picking out patients with defective gastric secretion.

The uropepsinogen test is even easier to perform, requiring only the collection of a twenty-four-hour specimen of urine and the estimation of proteolytic activity by a comparatively simple method. The levels of uropepsinogen in the urine of patients with pernicious anæmia are always very low, but similar levels may occasionally be found in subjects in whom other tests of gastric function are normal. Thus the chief usefulness of the

test in research is in screening subjects for more detailed investigation of gastric function, and in Oxford this has proved to be the most satisfactory single test. In clinical diagnosis, since a high result excludes pernicious anæmia, it has a real value in the investigation of patients who have received treatment with vitamin B_{12} and are no longer anæmic, and in whom there are reasons for questioning the diagnosis of pernicious anæmia.

Mr. A. W. KAY (Glasgow) gave an entertaining and complete account of his augmented histamine test, showing how he established in this test that maximal histamine response occurs, by means of dose-response curves. He emphasised the importance of performing the test in a standard way, paying particular attention to the time factor. The maximal gastric secretory response lasts about 30 minutes and is attained 15 minutes after subcutaneous injection of histamine. There was remarkable quantitative correspondence when repeated tests were done in the same subject. His experience is that most patients who show no change in the pH of the gastric contents with his test have pernicious anæmia. He believed that the test is of value in determining how much of the stomach should be resected in operations for peptic ulcer, but he was dubious of its value in the diagnosis of gastric carcinoma. The most interesting results he presented were of the effects of antrectomy and vagotomy on the secretion of acid by the stomach. Both procedures markedly reduce acid secretory response to maximal histamine stimulation, though the number of parietal cells is unaffected. Finally, Mr. Kay agreed with Dr. Taylor that true achlorhydria is uncommon and requires further investigation.

The discussion was opened by Dr. SIRCUS, who regarded the augmented histamine test as a major advance in investigation of gastric function. In Edinburgh they have noted that steroid therapy often results in an increased response of acid secretion to histamine. Dr. AVERY JONES (London) mentioned a patient who had hypersecretion of acid and showed no increased response to histamine: this was possibly due to a secretory islet-cell tumour of the pancreas. Mr. KAY said he had had a similar case. Professor WITTS (Oxford) said that if achlorhydria is found with the histamine test it may be due to faulty positioning of the tube, and that fluoroscopic control should be done. Other points discussed were the action of the antihistaminic drugs when used in the augmented histamine test, the observation by several observers that in pernicious anæmia there may be a small rise rather than a fall in the pH of gastric juice on histamine stimulation, and the value of direct measurements of pH in the stomach, using electodes in situ. Mr. Kay's opinion on this last method was that the results are too variable to be useful.

Investigation of Anæmia

Dr. SHEILA CALLENDER said that estimations of serum-iron levels alone are of little value in assessing whether a subject is iron-deficient: the iron-binding capacity of the serum should be measured as well. In this way, iron deficiency can be detected even in the absence of anæmia, (the *sideropænia sine anæmia* of Waldenström), when there is a low serum-iron level with normal or raised iron-binding capacity. The value of radioactive isotopes of iron is in assessing absorption, utilisation, and turnover of iron. Absorption can be measured by giving a test dose of labelled iron (and here the size of the dose is important) and measuring the amount excreted in the fæces; or by giving, contemporaneously, an intravenous dose of a second isotope of iron, and measuring the rate of disappearance of both oral and intravenous isotope from the plasma. In this way a corrected plasma curve for the oral isotope can be obtained, from which can be calculated the amount absorbed from the gut. Dr. Callender went on to discuss the use of foodstuffs labelled with radioactive iron. Such tests better reproduce normal conditions than giving a small dose of inorganic iron to a fasting patient. The best test is to give a normal bulk of food with the labelled material. In this way it has been shown that food iron absorption is reduced after gastrectomy, and this has cleared up the very important problem of postgastrectomy anæmia.

Tests of absorption have shown that, except in steatorrhœa and after gastrectomy, the commonest cause of chronic iron-deficiency anæmia is blood-loss. A " primary " failure to absorb iron is exceedingly rare. Finally, she thought that in-vivo counting of radioactive iron has little value, except in the diagnosis of myelosclerosis, where counts over some site of high marrow activity, such as the sacrum, may be abnormally low.

Dr. D. L. MOLLIN (London) gave an account of his experience with serum-vitamin-B_{12} estimations, and the use of vitamin B_{12} labelled with radioactive cobalt, in studies of absorption. The serum-B_{12} concentration, measured microbiologically by the *Euglena gracilis* method, is the best indicator of deficiency. If there is deficiency of the vitamin the absorption studies, using the fæcal excretion test, or the urinary excretion test of Schilling, can be done. He presented evidence that in subacute combined degeneration of the spinal cord the vitamin-B_{12} concentration in the serum tends to be lower than it is in pernicious anæmia, and that in the former, with marked B_{12} deficiency, there may be no anæmia. Patients with anatomical lesions of the small bowel, such as strictures and loops, show low levels of serum-B_{12}, mostly in the pernicious-anæmia range. Absorption of the vitamin is impaired and is improved only by giving antibiotics orally. When the ileum is involved, there is no way of enhancing absorption, since this structure is the main site of absorption of vitamin B_{12}.

Many patients with idiopathic steatorrhœa, sprue, and tropical macrocytic anæmia have low serum-B_{12} levels, but fail to respond completely to the vitamin and require folic acid as well.

Professor DACIE (London) completed the session by describing experiences at Hammersmith Hospital with tests of folic-acid clearance and folic-acid absorption. Dietary deficiency of folic acid is rare. The types of megaloblastic anæmia which are benefited by folic acid are those associated with idiopathic steatorrhœa, sprue, pregnancy, anticonvulsant therapy, leukæmia, cirrhosis, and kwashiorkor. He went on to give details of the intravenous folic-acid clearance test which seems to be a good indicator of folic-acid deficiency. Thus, in steatorrhœa with megaloblastic anæmia but normal serum-B_{12} levels the rate of fall in concentration of the injected folic acid is much higher than normal. In megaloblastic anæmia associated with mysoline therapy the fall-off is normal, which suggests here that the underlying defect is one of utilisation. In pernicious anæmia there may or may not be concomitant folic-acid deficiency, and the test cannot distinguish between it and megaloblastic anæmia due to folic-acid deficiency alone. Professor

Dacie concluded by giving an appraisal of the test of folic-acid absorption developed by Dr. Chanarin, which depends on measurements of folic-acid concentration in the serum after an oral dose, the patient being saturated with folic acid previously.

One of the points raised in the discussion was that radioactive iron studies alone are of no value in assessing whether splenectomy should be done or not, when there is other evidence both of splenic erythropoiesis and red-cell destruction. Dr. W. T. COOKE (Birmingham) gave his opinion that the rate of disappearance of folic acid from the serum after injection should not be interpreted in terms of tissue desaturation. Dr. I. CHANARIN (London) said that in his experience rapid clearance of folic acid occurs only where deficiency may be expected. Professor WITTS wound up the session by saying that in clinical practice estimations of serum-vitamin-B_{12} are seldom of value, because the patient has nearly always been given some vitamin B_{12}; that in anomalous cases labelled vitamin-B_{12} absorption tests may be useful if available; and that the application of the folic-acid tests is almost wholly a research procedure.

Steatorrhœa

Dr. W. P. H. SHELDON (London), speaking on cœliac disease, said that the more severe it is, the greater is the anæmia—usually hypochromic and responding somewhat indifferently to oral iron. Of 81 patients, 7 (9%) had a megaloblastic anæmia which responded promptly to folic acid. He laid stress on the importance of Dr. Shiner's biopsy findings and the need for further data. The chief advance in knowledge, however, has been the discovery of the effect of gluten. A gluten-free diet is not particularly palatable to the child; so the taste of wheat products should be retained by using gluten-free wheat starch. Gluten is broken down into gliadin and glutamine, and the noxious agent is in the gliadin, but tryptic digestion to peptides does not remove it. Digestion with hog's stomach does. The actual substance seems likely to be a peptide-glutamine complex which may well act directly on the organs rather than only on digestion—e.g., on mental processes and on growth. The rate of growth increase when a child returns to a normal gluten-containing diet will show whether he has acquired tolerance for gluten. Of 95 patients treated for eighteen months or more on a gluten-free diet, 72 continued normal growth when reverting to gluten; 11 relapsed, with full symptoms; and 12 showed intolerance only by slowing of growth.

Dr. W. T. COOKE (Birmingham) would discourage the use of such terms as malabsorption syndrome, sprue, and jejunoileal insufficiency, because the various clinical states associated with disturbances of the small intestine are taking on distinctive patterns, some with features not necessarily due to malabsorption but rather to malutilisation. Moreover, the term adult cœliac disease might be used to denote idiopathic steatorrhœa (with its implication that steatorrhœa is the most important factor), or non-tropical sprue (with its implied ætiological association with tropical sprue). It is justifiable to regard tropical sprue, with its different response to treatment, biopsy findings, folic-acid metabolism, and prognosis, as a specific clinical entity. In all but the occasional patient three investigations are needed for a diagnosis of steatorrhœa. In patients taking a normal mixed diet, a daily fat content of more than 6 g. in stools collected for three to six days can be considered abnormal. Careful radiological examination, with either flocculating or non-flocculating barium, is essential; for only by this method can many patients with apparently similar clinical symptoms be differentiated. Thirdly, complete hæmatological investigation is required. A persistently normal blood-count is strong evidence against adult cœliac disease. Patients with steatorrhœa due to pancreatic lesions rarely have anæmia unless they are also malnourished. The anæmia of adult cœliac disease is due to iron, vitamin-B_{12}, or folic-acid deficiency, either separately or combined. Upsets in folic-acid metabolism are important. Low serum-B_{12} levels are found in rather more than half the patients. In regional ileitis, 42 patients out of 80 had low serum-B_{12}, and the impaired absorption could almost always be restored by steroid therapy. The finding of 12 megaloblastic anæmias in 130 patients with regional ileitis again emphasised the importance of radiology. Among the laboratory examinations, glucose-tolerance tests and carotene and vitamin-A tests give little help, but the xylose-tolerance test appears useful in separating the patients with adult cœliac disease from the other disorders. Jejunitis, with its tendency to resolve, may simulate adult cœliac disease, since absorption of folic-acid in the jejunum may be grossly deficient. Three more recent investigational techniques—intestinal biopsy, the folic-acid excretion test of Girdwood, and the response to gluten-free diets—make it evident that adult cœliac disease is a distinct clinical entity. It is probably a familial constitutional enzymatic defect, embracing the pteroylglutamate complexes, though whether it is sited in the intestinal cell or in the liver is not evident.

Dr. J. BADENOCH (Oxford), after reviewing earlier observations on the anæmias associated with stricture and blind loops, described his own work on the intestinal diverticula. He laid stress on the occurrence of diarrhœa, though only half the patients had steatorrhœa. Some patients will present with anæmia indistinguishable from pernicious anæmia and be so treated. The necessary radiological studies are sometimes difficult because the barium does not enter the narrow-necked diverticula. Surgical treatment is unsatisfactory and it is better and safer to treat these patients by medical means. Vitamin-B_{12} should be given monthly, and daily supplements of calcium gluconate 15–20 g., folic acid, and vitamins. In the acutely ill patient, broad-spectrum antibiotics should be administered, but Dr. Badenoch did not favour their continued administration. Prednisone may also bring about remission.

In the discussion, Professor A. W. WOODRUFF spoke of the difference in prognosis between tropical sprue and the disorders occurring in temperate climates. Dr. CALLENDER reported dramatic increase in iron absorption in cœliac disease treated with prednisone; and in a child the initiation of gluten-free diet increased the absorption from 2% to 40%. Dr. A. DOIG (Edinburgh) recalled Girdwood's demonstration that bacteria from intestinal diverticula will take up vitamin B_{12} but actively produce folic acid.

Dr. P. B. B. GATENBY (Dublin) said that, in reports on the treatment of iron deficiency, ferrous sulphate, ferrous gluconate, and ferrous succinate had all apparently induced much the same rate of hæmoglobin synthesis; but intolerance—possibly due to a higher dosage—was much commoner with ferrous sulphate. Among 4000 pregnant women he found 350 with a hæmoglobin below 10 g. per 100 ml. Of these, 300 could take ferrous sulphate with good results. Of the 50 who were intolerant, 20 did not benefit from other oral iron preparations and needed parenteral administration. In late pregnancy the

rate of hæmoglobin regeneration is much the same whether intravenous or intramuscular iron preparations are used; but on the whole ' Imferon ' is the treatment of choice. The indications for parenteral therapy are gastric intolerance, gastrointestinal disease (such as ulcerative colitis), certain types of steatorrhœa, rheumatoid arthritis, late pregnancy, and possibly for the replenishment of iron stores in recurrent anæmia.

Prof. L. J. DAVIS (Glasgow), whose paper was read in his absence, had reviewed 374 megaloblastic anæmias under his care in 1948–51. Of these 315 had pernicious anæmia: the other diagnoses were malabsorption states (20), pernicious anæmia in pregnancy (16), nutritional deficiency (5), and anticonvulsant therapy (1), leaving 17 undetermined. Of 73 patients treated with vitamin B_{12} by mouth combined with intrinsic factor, 20 relapsed. He concluded that oral preparations are unsatisfactory and that regular parenteral therapy with B_{12} is best. He recommended 1000 μg. followed by 250 μg. weekly until blood-levels are normal, and therafter monthly. 105 patients were treated with single doses of 1000 μg. every three months, but by the end of this period their serum-B_{12} was approaching abnormally low levels. He emphasised the dangers of folic acid in these patients and described the blunderbuss therapy sometimes advocated.

Dr. C. F. HAWKINS (Birmingham), speaking of steatorrhœa, referred to the difficulty of assessing results of treatment in a condition which can show such dramatic and unexpected remissions. With the usual restriction of fat, and a high-protein diet, at least 70% can expect to be well enough to do their work satisfactorily. Steroid therapy brings temporary improvement, but relapse is likely when it is discontinued. In conjunction with Dr. J. M. French, he has obtained clinical cure in 16 out of 22 patients. Often this effect was quickly manifest, though it could take months. Most striking was the effect on the incapacitating weakness and lassitude. In all patients the blood-picture became essentially normal without any other therapy. He ascribed failure of a gluten-free diet to four causes—the wrong diagnosis, insufficient time, incomplete diet, and unknown reasons. As to these last, intestinal allergy might possibly explain the radiological pictures; a folic-acid deficiency might be present; or there might be an upset of glutamine-peptide complex.

In the discussion, Dr. DISCOMBE wondered whether it was necessary to aim at a 1·2% increase of hæmoglobin per day when half this is sufficient. He gave 65 mg. elemental iron (one tablet) daily for six months to blood-donors who were anæmic. Their hæmoglobin was restored to normal in three months and he had no difficulties with intolerance.

Alimentary Bleeding

Dr. GEORGE DISCOMBE (London) discussed tests for occult blood in the fæces. Benzidine has caused bladder cancer in those engaged in its manufacture and will therefore become a " museum piece ". Its place can be taken by orthotolidine, which gives better results. Dr. Discombe has found both ' Occultest ' and ' Hæmtest ' tablets satisfactory. The former is much more sensitive, and he favours a sensitive test for occult blood. Those with a positive result can then be carefully examined with dietary and medicinal precautions. He felt that the number of false positive results from the peroxidase in the stools had been exaggerated, but to ensure accurate results it is necessary to render oxidising enzymes inactive. In the Harrison benzidine test this has been achieved by boiling, which has always been the most troublesome feature of the test. Treatment of the stools with 1% sodium azide (a poison) provides an alternative and easier way of inactivating peroxidase. Dr. Discombe then described some promising but provisional results of testing for occult blood with orthotolidine after preliminary treatment of the stools with sodium azide. If these results are confirmed, a test will be available whereby it will be easy to test for occult blood in the side-room—" safer, cleaner, quicker and cheaper " than testing in the laboratory.

Professor WITTS, speaking on anæmia after gastric operations, estimated that since 1948 some 100,000 persons in England and Wales must have undergone a partial gastrectomy. As iron-deficiency anæmia almost inevitably follows this operation, the problem must be a considerable one. The importance of bleeding in the ætiology of such anæmia is disputed. It may be episodic, and a sudden fall in the hæmoglobin after operation should suggest blood-loss. But the main mechanism seems to be a failure in the absorption of iron. Though partial gastrectomy reduces the size of the stomach and the amount of hydrochloric acid it secretes, experiment has shown that there is no defect in the absorption of organic and inorganic iron (given on an empty stomach). The diminished absorption seems to be due to the impaired function of the stomach as a " hopper " for holding iron and food while the iron is converted from the ferrous to ferric state and absorbed. Another contributing factor is the reduction in the amount of food which people take after gastrectomy. Any gastrectomy will reduce the area secreting intrinsic factor, and after partial gastrectomy such persons tend to have a low level of serum-B_{12}—though (in those cases with a macrocytic anæmia) not quite so low as in true pernicious anæmia.

In iron-deficiency anæmia after partial gastrectomy, parenteral iron is often the treatment of choice. If iron is given by mouth, it should not be given in tablet form; for the tablets may be irritating and may hurtle through the stomach.

Pernicious anæmia is inevitable after a total gastrectomy, but relatively few cases are seen, because (1) resections are very seldom absolutely complete and (2) others are often treated with vitamin B_{12} from the time of operation. B_{12} should be given in all these cases, supplemented with iron, though iron deficiency is not such a special problem in these cases as after subtotal gastrectomy. If there is no response to B_{12} and iron, the possibility of a blind-loop syndrome should be considered.

Dr. AVERY JONES reviewed the problem of unexplained hæmorrhage from experience of 2526 cases of alimentary hæmorrhage admitted to the Central Middlesex Hospital in 1941–47. He emphasised the importance of what he termed the " acute lesion group " as a cause which will be missed unless early gastroscopy is carried out. This group accounted for nearly a third of those in his series. The lesion is usually an acute ulcer but occasionally a gastrostaxis may be found—not infrequently around a stoma. Acute ulcers most often occur on the posterior wall or the lesser curvature; they have an equal sex incidence, but in men appear more likely to become chronic. With early gastroscopy and a careful search for general medical causes of alimentary hæmorrhage, he was able to explain the cause of the hæmorrhage in half the cases in the X-ray-negative group. But he emphasised the importance of following-up this group; for he has later been able to show a lesion in 24% of these cases—usually a peptic ulcer but even some new growths.

An exhaustive list of the causes of alimentary hæmorrhage included food allergy: a fellow of the college has a hæmatemesis each time he eats onions. The Mallory-Weiss syndrome can be diagnosed by a history of vomiting, from whatever cause, followed by the vomiting of bright red blood from splitting of the longitudinal fibres of the lower œsophagus. Among other disorders, von Willebrand's disease should be considered as a possible cause of recurrent bleeding, and pseudoxanthonum elasticum is a rare possibility. Aspirin plays a significant role in bleeding, not only by producing an acute lesion but also in provoking a chronic ulcer to bleed. It may also be found to be the cause of unexplained cases of recurrent anæmia.

In reply to a question by Professor WITTS, Dr. AVERY JONES gave advice on what to do about the difficult case of recurrent alimentary hæmorrhage for which no cause can be found after careful investigation. He advised a laparotomy at the time of bleeding.

PÆDIATRIC SURGERY

A STRIKING feature of the meeting of the British Association of Pædiatric Surgeons held in London last week under the presidency of Miss ISABELLA FORSHALL was its cosmopolitan character. This was particularly evident at the dinner in the Apothecaries Hall, when brief speeches were made by representatives of many European countries, as well as Japan, Australia, and the United States.[1] Several countries were able to report growing recognition of the importance of pædiatric surgery, and the recent appointment of Mr. A. W. Wilkinson to the newly created chair of pædiatric surgery in London was evidence to those from abroad that such recognition is not lacking in this country.

Respiratory Emergencies

For his Moynihan lecture at the Royal College of Surgeons Dr. WILLIS POTTS (Chicago) chose the subject of Respiratory Emergencies in the Newborn. In some infants, he said, the emergency is recognisable as such and the urgency of treatment is unassailable. Among this group he described cases of tension pneumothorax or tension cyst where a child's life can be saved by aspirating 50 c.cm. of air from the chest and having the needle and syringe ready for a further aspiration should this be necessary before definitive treatment can be established. Another condition in which the urgency is sometimes overlooked is congenital diaphragmatic hernia. The amount of bowel in the chest may not be sufficient to cause serious distress at first, but any sudden increase in intra-abdominal tension can force more bowel into the chest, and kill the child in next to no time. The one special examination which is likely to help more than any other is a good upright anteroposterior and lateral X-ray film of the chest, and the emphasis in this sentence is on the two words " upright " and " good ". A horizontal radiograph is far less useful, and a poor radiograph may make it impossible to distinguish between cases in which major surgery is essential and others where less radical measures may suffice.

The preoperative and postoperative management of the newborn in respiratory distress is going to depend very much on the quality of the resident medical staff and the nursing staff, and Dr. Potts drew attention to the importance of having an emergency tray with endotracheal tubes, fine plastic suction tubes, and above all a laryngoscope in every ward in which these infants are cared for. Such apparatus is useless unless the medical staff who are first called to the child by the ward sister are adept at laryngoscopy and the insertion of an endotracheal tube in infants. Every resident in a department dealing with surgical problems in infancy should know how to handle this instrument.

Meningoceles

If the Moynihan lecture by Dr. Potts was directed mainly to management of conditions endangering life, several papers were concerned with the rehabilitation of infants suffering from spina bifida and its complications. How often a mother brings a child to the outpatient clinic at the age of 3 or 4 years with a large meningocele, hydrocephalus, deformed legs, and an iffected dilated urinary tract, with the story that the doctor told her that the baby would die before 9 months of age, or that the welfare clinic assured her that she would not rear him above 2 years of age! In his review of spina bifida cystica Dr. K. M. LAURENCE drew attention to the large number of cases who are certainly alive at 8 years of age and may well live very much longer. This should bring to all those who meet this serious incapacitating condition the realisation that they should help these children as much as possible. The meningoceles can be dealt with in the neonatal period, and there is something to be said for this instead of leaving them until 18 months or 2 years of age as advocated by Ingraham and Motson. True, the child may develop hydrocephalus; but, thanks to the pioneering work of Spitz in Philadelphia there is a good chance of controlling this condition and allowing brain development to take place. The technique of inserting a Spitz-Holter valve was demonstrated at the meeting, and this procedure is now done in three or four centres in this country.

Two aspects of myelomeningocele which are usually neglected are the problems of the bladder, and the problems of the lower limbs. Mr. D. F. ELLISON NASH has put forward suggestions for the management of these babies, and there is little doubt that attention should be paid to the bladder at the earliest possible moment so as to prevent the infection of residual urine. He described his technique for plication of the urethra, which has some place in bladder control in these serious cases.

Mr. W. J. W. SHARRARD propounded some stimulating views on the dislocation of the hip which so often accompanies myelomeningocele. He had come to the conclusion that this was essentially a paralytic dislocation, since the muscles which were paralysed were exactly the same as those which are paralysed when dislocation of the hip complicates poliomyelitis.

The management of this dislocation must therefore be based on principles differing from the management of the ordinary congenital dislocation of the hip, and Mr. Sharrard was able to demonstrate that a well-thought-out and long-term plan of treatment would give some of these infants the chance of standing upright and walking.

Œsophageal Atresia

In his Simpson-Smith lecture, delivered at the Hospital for Sick Children, Great Ormond Street, Dr. WILLIS

1. After Sir JAMES PATERSON ROSS had replied for the Guests, the following spoke informally: Dr. YANAGISAWA (Tokio), Prof. FRITZ REHBEIN (Bremen), Dr. HARTL (Linz, Austria), Dr. WANDA PORADOWSKA (Warsaw), Dr. KAFKA (Yugoslavia), Dr. MÁZAL (Brno, Czechoslovakia), Dr. WILLIS POTTS (Chicago), PROF. A. J. CRAIG (Malta), Dr. MATTI SULAMAA (Helsinki), Dr. PETTERSON (Göteborg, Sweden), Dr. JUAN LESTACHE (Madrid), Professor SOAVE (Genoa, Italy), Mr. RUSSELL HOWARD (Melbourne, Australia), Prof. MAX GROB (Zürich, Switzerland), Dr. AKKARY (Alexandria, Egypt), Dr. D. VERVAT (Rotterdam, Holland), Dr. WINKEL-SMITH (Copenhagen, Denmark), Dr. N. TZEMAILAS (Athens, Greece).

POTTS discussed the factors which had contributed to the gradual lowering of mortality in the treatment of œsophageal atresia in his unit so that the recent figures showed that three out of four patients were surviving. In his large series of 148 cases, Dr. Potts was able to pick out a number of factors which he thought had contributed to the improving results.

The following morning, Prof. FRITZ REHBEIN (Bremen) discussed the complications in the treatment of œsophageal atresia and Mr. R. B. ZACHARY (Sheffield) presented two cases of complete absence of the œsophagotracheal septum. During the discussion on these cases, and on Dr. Potts' lecture, the discussion centred round many aspects of the treatment of œsophageal atresia including the choice of transpleural or retropleural approach, the routine use of a fine polyethylene cannula through the nose and down the œsophagus into the stomach for feeding purposes, and the problems connected with anæsthesia.

SARCOIDOSIS

AN international symposium on sarcoidosis, arranged by the British Postgraduate Medical Federation, was held in London from June 30 to July 2.

Dr. L. SILTZBACH (New York) felt that a definition of sarcoidosis should include the following reference to the Kveim test:

"The intracutaneous Nickerson-Kveim test employing a sarcoid tissue suspension of known activity and specificity is microscopically positive in a majority of instances among patients with florid lesions. The test is of value in the absence of other tissue biopsy confirmation of the diagnosis or when clinical and histological findings conflict."

Dr. J. G. SCADDING restricted himself to a morbid-anatomical definition to include the tissues most frequently involved and the histological changes observed in those tissues. Dr. A. D. THOMSON pointed out that a pathologist could only report that the histological changes were consistent with the diagnosis of sarcoidosis, for sarcoid tissue was a non-specific response to a variety of agents. Dr. O. REFVEM (Oslo) enumerated several chemical, infective, and neoplastic processes known to provoke these local sarcoid-tissue reactions. In reviewing the vexed problem of ætiology, Dr. J. TURIAF (Paris) opposed the view that sarcoidosis was related to tuberculosis.

Epidemiology of the disease in Great Britain has so far been unrewarding, but Dr. J. CHAPMAN (Dallas, Texas) surveyed its global distribution. Dr. M. CUMMINGS (Washington) provided interesting data based on its prevalence in the South-Eastern region of the United States. He and his coworkers have long been aware that forested areas might provide some clue. More recently they have observed that pine pollen has certain chemical similarities to the tubercle bacillus, including acid-fast staining properties. A pine-pollen extract provoked delayed-type (tuberculin-type) skin-test reactions in half of a group of patients with sarcoidosis, and it also produced local tuberculoid granulomas in animals. Further immunochemical and epidemiological investigations are in progress to definite the substance and its possible role in the disease. Dr. W. G. STRAWBRIDGE (Cardiff) drew attention to a long-chain fatty acid which he had uncovered in sarcoid tissue. Interesting and important work remains to be done to define the relationship of this substance to Dr. Cummings' pine-pollen extract, and their possible identity with the active fractions of Kveim antigen.

Dr. W. J. WILLIAMS (Cardiff) outlined his painstaking endeavours to identify the chemical composition of the inclusion bodies in beryllium disease and concluded that it was probably calcium carbonate. Dr. I. B. SNEDDON (Sheffield) related his experience of a beryllium skin-patch test. It was similar to the Kveim test in that a sarcoid granuloma appeared, within a month, at the site of application of beryllium; it was specific for berylliosis.

Prof. C. E. DENT emphasised the value of an oral cortisone test for differentiating hypercalcæmia due to sarcoidosis from that due to a parathyroid tumour in the occasional difficult problem case. Whereas cortisone did not influence the serum-calcium level in the presence of a parathyroid tumour, it produced increased fæcal excretion and a fall to normal of the serum-calcium level in sarcoidosis.

Dr. S. LÖFGREN (Stockholm), who pioneered the view that erythema nodosum and bilateral hilar lymphadenopathy are early manifestations of sarcoidosis, described his experience of this syndrome in Sweden and also the results of renal biopsies in patients with hypercalcæmia due to sarcoidosis. In his experience, serum-uric-acid levels were higher in patients with sarcoidosis than in those with tuberculosis or in other control subjects. Calciferol provoked elevation of serum-uric-acid as well as serum-calcium levels.

Dr. H. LUNDBÄCK (Stockholm) had studied sarcoid tissue in culture and illustrated his communication with beautiful photomicrographs. Dr. CUMMINGS drew attention to similar studies by his colleague, Dr. H. Bernton. It was hoped that such studies would yield ætiological information or alternatively provide a system for reproducible immunological experiments.

Dr. CLIFFORD HOYLE based his prognosis of the various manifestations of the disease on the course which he had personally followed for many years in a large series of patients. He emphasised the high rate of spontaneous clearing of bilateral hilar lymphadenopathy. Dr. M. SONES (Philadephia) had followed the course of 200 patients for twenty years. There was a mortality-rate of about 10%, mainly from pulmonary heart-disease.

Dr. H. ISRAEL (Philadelphia), who had collaborated with Dr. Sones in this long-term follow-up, felt that the pattern of disease in their Coloured patients was basically similar to that observed in White Europeans. One notable difference was the comparative rarity of erythema nodosum in America.

Dr. D. G. JAMES outlined the indications for corticosteroid therapy in sarcoidosis, stressing eye disease, disfiguring skin lesions, hypercalcæmia, and a worsening chest radiograph as the most important. Yardsticks for measuring the response were clinical, histological, and radiological. Steroids were the only drugs which favourably influenced all three. By these criteria, triamcinolone was proving just as effective as prednisolone, and a new drug SQ 9727 (Squibb) showed equal promise. Mr. R. P. CRICK emphasised the value of early corticosteroid therapy for the ocular lesions. Dr. INGRID GILG (Copenhagen) claimed good results from the use of calciferol in patients with cutaneous sarcoidosis attending the Finsen Institute. Prof. K. WURM (Freiberg) had observed spontaneous improvement in 16 of 18 pregnant patients. He had never seen deterioration during pregnancy, although some relapses had occurred after parturition.

During the conference, Dr. K. CITRON and Dr. Scadding exhibited the results of their investigations of immunological responses in sarcoidosis.

In England Now

A Running Commentary by Peripatetic Correspondents

MORE excitement in Cockaignshire, where Dr. X. has again been hauled before the Executive Committee on a charge of over-prescribing. It seems he was called to a gipsy girl who lived on a barge which, said Dr. X., like a burnish'd throne, burn'd on the water; the poop was beaten gold, purple the sails, and so perfumed that the winds were love-sick . . . (Here the Chairman over-ruled Mr. Crumb, the Ministry of Health's representative, who remarked that according to his notes, the winds were N.N.E. and blowing a half-gale.) His patient, resumed Dr. X., had been advised that if her nose had been shorter, the whole history of the world would have been different, and she now requested a plastic operation on the N.H.S. in a gallant attempt to improve the situation before it was too late. She agreed with the doctor that she had rather left things until the last moment, but said she had been convalescing from a nasty asp-bite.

The nobility of this *amende honorable* by a beautiful refugee of royal blood had so moved him (declared Dr. X.) that he had unhesitatingly continued the treatment ordered by the lady's previous doctors, viz:

R Orient pearls ii
Vini ad ℥ ½
F. Sol., Sig. ℥ ½ tds., pc.

Unfortunately the only solvent for Orient pearls, apart from battery-acid, appeared to be 'Zippo' vitaminised port-type tonic wine. This fluid, he claimed, should therefore be regarded in this case as a medicine. How *could* he, he asked (opening the door to admit two workmen carrying a roll of carpet), how *could* he disappoint this brave little woman? Her offer was sublime, a veritable widow's mite, and she had insisted in attending there today although her poverty was such that, as they would see, she had literally nothing to wear except the carpet she was rolled up in. This revelation disturbed the committee considerably.

Mr. Crumb, on behalf of the Ministry, said that the female nevertheless appeared to be adequately nourished and could he assume that the figures 36-24-36 he had just been given were her N.H.I. number? Dr. X. (said Mr. Crumb) had referred them to Herodotus, Plutarch, and certain insolvent Elizabethan playwrights, but what were they compared with Statutory Instrument 1234 M.H., E.C.S. (M.) 4a/36/48? Also (continued Mr. Crumb) the cost to the country of Dr. X's prescription was £1200 for one week's course of Orient pearls, plus 3*s*. 9*d*. for the zippo tonic wine. Admittedly there was 2*d*. back on the bottle, and the Ministry would never condone any N.H.S. patient being deprived of any necessary medicament, no matter how costly, but he had been advised that nitric acid (fuming) was quite as effective a pearl-solvent as zippo, and was equally palatable. The prescription of zippo in this case was extravagance and he asked that 3*s*. 9*d*. be deducted from Dr. X's next cheque; and, while again emphasising that the Ministry would never condone, &c., &c., he recommended that Dr. X. be also fined £1200 for over-prescribing.

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A little charm, she maintained, is worth a lot of knowledge, even in examinations. At the sight of her the most hardened and cantankerous patient would announce that the lump in his neck was a carcinoma of thyroid treated with radio-iodine, or that he had fibrosis of the left upper lobe, " and don't forget to say I have deviation of the trachea." The ladies were equally obliging and whispered words of encouragement and helpful information. " The tall one always asks about me big toe, and 'e wants yer to say 'Gout, which is rare in a woman of this age.' I'm not supposed to say, but I like your face."

But the fortune in her face was not infallible. The last examination she ever intended to take arrived before her social engagements had allowed her time to read the section entitled Neurology. In spite of appealing glances and powerful silent prayers she was led past a coughing patient whom she had met in a previous examination and whose acquaintance she would have been delighted to renew, and was left with an unpromising character who was obviously neurological. Her opening gambit, a bright " What's the matter with you?" received the sullen reply " That's *your* guess ". A few ineffective taps with a patella hammer and a jab or two with a pin brought into her mind, as though by divine inspiration, the word syringomyelia, a condition which she had heard was common in examinations but about which she knew nothing.

" Have you got syringomyelia?"

" That's *your* guess."

It was hopeless, and time was passing. She looked round. The examiner was out of earshot. She jabbed again with the pin and said fiercely: " I don't believe you have syringomyelia. I think you have syphilis."

This provoked the desired response. The patient, in high dudgeon, announced that he most certainly had not got syphilis, and that he had syringomyelia, which he could prove because he had dissociated anæsthesia on both sides of the body, &c., &c. He knew all the answers, and so, at the end of five minutes, did she.

She presented the case flawlessly. But rough justice was done. The examiner, equally impervious to her undoubted charms, while agreeing with her diagnosis and physical signs, felt unable to pass her because of her complete inability to describe any form of syphilis that might be considered as a differential diagnosis.

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In appearance and habits we are in no way remarkable, and it has been our ambition to proceed inoffensively through life, breathing quietly through our nose and causing as little fuss as possible. But recent events have conspired to present us to the world as a wrecker, a vandal, a despoiler of other men's property. We are having Plastic Trouble.

The first manifestation of our Trouble occurred while we were on holiday in Devon. We were sitting comfortably one morning on the black plastic seat, placidly admiring the black bath and the lurid murals of orange flames, when we were startled to hear a sharp crack and to have our equilibrium momentarily disturbed. When we looked, what should we find but a comminuted fracture of the left posterior quadrant of the seat. They were very pleasant about it, but we said no, it was entirely our fault, and we must insist on paying (thirty-five bob it cost us, too).

The second manifestation was a couple of months ago, while we were visiting a friend of ours in the pathology department. A nice white job it was, but white or black is all the same to our Trouble, so long as it is plastic, and crack it went just like the first. On this occasion we were slightly less inclined to take an altruistic stand on the matter of payment, but fortunately our friend made little of the occurrence, and we wrote it off to departmental maintenance.

The third attack took place last week, in the newly opened establishment in connection with our hospital library. This time we did not hesitate. As soon as we heard the now familiar crack we made haste to sneak out as unobtrusively as possible, leaving our senior assistant surgeon, the only other occupant of the library, to take the blame.

We find all this very disturbing, and the thought that at any time we must expect to hear the short sharp report marking the end of number four is interfering with our sleep. We had no difficulties of this kind in our youth. We remember a large wooden throne on which we were wont to spend many happy hours singing to the illustrated papers which were stored in lockers on each side of the business portion of the machine. At school the seats were made of inch-thick timber, and in later years we had occasion to patronise a cold stone contraption in a Scottish castle. A man could relax, without fear of personal injury or financial embarrassment, when seats were solid affairs made of natural material and not flimsy wafer-like contrivances whipped up out of coal and air and casein.

Letters to the Editor

CHILDREN IN HOSPITAL

SIR,—I am so fully in agreement with your leading article last week, " What Hospitals for Children ? ", that on reading it I felt as if I had written it myself. Your recommendations, and those of Professor Illingworth for the care of children in hospital, are nearly all standard practice at Queen Mary's, a general children's hospital of 550 beds of which I have been physician-superintendent since 1953, and we could indeed add to these recommendations from our experience here. I am also well aware from personal experience of the difficulty of working to these high standards for children in a small children's ward of a general hospital, or in a purely long-stay children's hospital.

While your editorial was in the press, we were informed by the South West Metropolitan Regional Hospital Board, out of the blue and without consultation, that they proposed to close Queen Mary's Hospital for Children, Carshalton, Surrey, within the next few months, and to use the building for another purpose for which they have been unable to secure an allocation of capital from the Ministry of Health.

Before my appointment five years ago I was assured that it was the regional board's intention to develop Queen Mary's fully as a general children's hospital. Since then great strides have been made, and the hospital is now fully staffed and equipped to deal with all types of case at all ages from 0 to 16. Queen Mary's has at present 550 beds, with a further 150 in reserve. Although more than half the beds are occupied by long-stay cases, 82% of the *children* discharged have been in hospital for less than two months.

The board have always worried about the financial implications of Queen Mary's being filled to less than capacity, but they have never shown any serious interest in, or appreciation of, the fundamental problem of children's bed distribution with which your editorial deals.

There is no member of the board or of the board's staff who is competent to advise the board on matters of pædiatric planning. There is no pædiatric adviser. There is no pædiatric committee. When a year or two ago I asked if the board would consider seeking expert advice on certain of their pædiatric problems, the Chairman's answer was " No ". It seems most unlikely therefore that the board have on this occasion been expertly advised before concurring with the Ministry's suggestion of abandoning, for the sake of temporary financial convenience, the largest general children's hospital in southern England. I very much doubt whether the Ministry themselves took expert advice before pressing this recommendation, with financial strings attached, on the regional board.

I am not one of those who think that it is the board's policy to abandon children's hospitals in favour of small children's wards in general hospitals. I would make a graver charge. It is that neither the board nor the Ministry of Health have any policy at all on the subject, and do not consider the question of very great importance. This is certainly the impression which I have gained after five years as physician-superintendent of the board's only large children's hospital.

I have long made plain to the board my view that if they decided to close small children's wards in general hospitals near Queen Mary's, to close children's fever beds, and to prohibit wherever possible the treatment of children in adult wards, the continuation of Queen Mary's as a 550–700-bedded children's hospital would be justified in even cold financial terms: and you have already cogently argued in your editorial how much this would mean in terms of improvement of the service given to the children concerned. I do not think that the regional board have taken any serious steps to obtain the facts and figures on which alone an accurate assessment of this possibility could be made. This is, in any case, only the most obvious of several ways in which the continuity of the work of this great children's hospital (which deals with 4300 inpatients, 11,500 outpatients, and 2400 surgical operations per annum) could be secured. There is not the space here to refer to the implications of this policy on the training of general nurses, which, however, I have recently discussed elsewhere.[1]

This decision does not of course affect Queen Mary's alone. It is a direct threat to the continuation of the Register of Sick Children's Nurses (Queen Mary's Nursing Training School provides 15% of the annual entry to this register), it would constitute a strong precedent for a reversal of the policy which you advocate in your editorial, and it would make it impossible for the education authority to implement the Minister of Education's recent recommendation about education in hospitals, for most of the children in the South West Metropolitan area.

I find it hard to believe that the Ministry and regional board realise just what it is that they are proposing to throw overboard. In its combination of acute medical and surgical services with all the special provision necessary in special units for the treatment of poliomyelitis, rheumatism, cerebral palsy, muscular dystrophy, and fevers, and with its hospital school staffed by 40 general and specialist teachers, Queen Mary's provides a better cross-section of pædiatric care than is available anywhere else in the country. This is well recognised by the matrons who subsequently employ nurses trained at Queen Mary's, by the medical schools of Guy's and St. Thomas's Hospitals, whose one week of residence for an intensive course at Queen Mary's is recognised as important, and is highly valued by the students; and by the Surrey Education Authority who well recognise that it is only in a combined acute and long-stay hospital of this kind that they can efficiently give the services which are expected of them in the education of sick children.

I do not at the moment know exactly what form our swift response will take, but I do not believe that this far-reaching proposal, taken, as I believe, without any real understanding of its effect upon the care of sick children, or of the future of pædiatrics or pædiatric nursing, will be allowed to stand.

Queen Mary's Hospital for Children, Carshalton, Surrey. DAVID LAWSON Physician-Superintendent.

SIR,—A warm and sincere welcome to Professor Illingworth's article and your leader of July 26. I agree with almost everything that is said, except at one point where Professor Illingworth does not go far enough. He commends daily visiting, which, to me, is as archaic as no visiting at all. In my view—and I speak with nearly ten years' experience—unrestricted visiting solves most of the problems of children in hospital.

I can best make clear what I mean by unrestricted visiting by quoting from the pamphlet we give to parents. It states: " You may visit when you like, as often as you like and you may stay as long as you like." We accept any adult visitor and, with supervision, children as well.

As there is no limit on length of visit, we are prepared to and frequently do provide residential accommodation for the parents. I stress the plural, since it is usually the mother who is admitted with the child, but in certain cases, usually bulbar poliomyelitis in older children, both parents may want to live

1. The Future of Children's Hospitals, *Health Horizons*, summer edition, 1958.

in the hospital for several days. In the matter of admitting parents we do not specifically consider the age of the child, and the only judges of whether they live in or not are the parents themselves.

Recently we have made a tentative advance from this position, and are trying out the idea of admitting not only the child and its mother, but her other young children as well; for let it be remembered that when a mother comes into hospital with one child, others left at home are deprived of her presence.

What we claim for our system is its extreme flexibility, for, as Professor Illingworth points out, the reaction of children (and one might add parents) varies greatly where admission to hospital is concerned. Obviously, if the facilities we provide were abused, chaos would result; but I would point out that parents are not the congenital idiots that is sometimes supposed. Moreover, hospitals are run for the benefit of the population and not for the convenience of the medical and nursing staffs, and as far as the former is compatible with efficiency it must take precedence over the latter. Our experience shows that the more consideration we show for parents' requirements the more consideration they show for us. I have by no means achieved all that I should like in this direction, but our modest advance has convinced all concerned that nothing but good has come out of it.

May I make a plea that daily visiting is not a target to be aimed at but something to be discarded as insufficient for its purpose.

Tunbridge Wells. N. M. JACOBY.

SIR,—I should like to make two comments on the excellent and understanding article by Professor Illingworth and the leader in the same issue.

First, Professor Illingworth appears to lay inadequate stress on the fact that nearly all children, and certainly those over 6–7 years of age, will be immensely reassured by some logical explanation in simple terms, preferably by a doctor, of the reasons for their stay in hospital. As patient and doctor come to know each other better, it is possible and profitable to discuss the problems more fully; to give reasons for the treatment applied, and for the length of stay in hospital. The child's understanding of these problems and their discussion is almost always underestimated.

Second, your leader, in essence, contains a plea for the centralisation of pædiatric care—for all the very good reasons given. However, while this may be practicable in urban areas, it is much less possible in many regional hospital areas because of the enormously increased difficulty of parental visiting with the longer journeys to be made. Surely Professor Illingworth's admirable plans for the segregation of all children into their own wards in community hospitals should be followed by a period of reassessment and careful thought before segregation into regional pædiatric hospitals. "A relatively small number of big pædiatric hospitals" "in each region" might well cause surprisingly great hardships in visiting.

East Grinstead, Sussex. RUSSELL M. DAVIES.

SHOCK

SIR,—Discussions on shock tend to be somewhat kaleidoscopic, each successive view being coloured by the particular interests and experience of its contributor. The impression received by the student is necessarily confused, and lacks definition. The following is an attempt to define shock in simple terms.

The primary function of the blood is to carry oxygen to all parts of the body. To this end we are provided with a pump which drives ten pints of blood through an elaborate system of pipes at an appropriate pressure. An abrupt fall in this pressure is called shock. Shock is acute hypotension. This definition has the virtue of impressing on nurses the importance of blood-pressure readings; it covers every conceivable kind of shock, and it has the additional merit of being completely true.

The pressure can be lowered in three ways and in three ways only:

(1) By weak action of the pump (e.g., coronary occlusion, injection of thiopentone, or emotional impact).

(2) By diminishing the blood-volume (i.e., loss of blood, plasma, or electrolytes).

(3) By increasing the diameter of the pipes (e.g., the vasodilatation which follows an adrenal crisis, the induction of hypotensive anæsthesia, or the development of profound toxæmia).

The clinical features of types 1 and 2 are almost identical, and are associated with compensatory vasoconstriction. This vasoconstriction is a mixed blessing. It makes the patient look distinctly poorly, and is thus an aid to diagnosis. It makes him feel cold, and led us, not so long ago, to warm him up with blankets, hot-water bottles, and paraffin stoves—which is clearly absurd. It may still tempt us into operating on patients who have lost a great deal of blood without, as yet, becoming shocked. They *will* become shocked if we operate on them.

The clinical features of type 3 are entirely different, and rather deceptive. The patients are not very pale, but they are slightly cyanosed; the temperature may be raised, and the skin is warm. Diagnosis, with a sphygmomanometer, is quite easy—provided one remembers to use the sphygmomanometer.

Many cases of diffuse peritonitis combine the features of types 2 and 3, the fluid loss competing with the toxæmic vasodilatation.

The treatment of shock is an essay in reason. We give blood to the wounded, plasma to the scalded, and electrolytes to those with vomiting, diarrhœa, or an intestinal fistula. We give cortisone and noradrenaline to patients with adrenal crises, and to those with diffuse peritonitis we give noradrenaline, cortisone, and electrolytes. We have not yet found a remedy for the stricken heart, so to patients with coronary occlusion we give our sympathy.

Shock will become irreversible if the blood fails in its primary object of bringing sufficient oxygen to the tissues. This will occur if the anæsthetist fails to oxygenate his hypotensive patient, if the traumatic surgeon delays replacement transfusion until the constricted arterioles have strangled the tissues in their grip, or if the peritonitis is so severe and unresponsive to treatment that the poisoned blood-vessels can no longer be constricted by vasopressor agents.

Lastly, sweating is an inconstant phenomenon of no diagnostic value. Anyone who has danced a Paul Jones will concede the observation that some people sweat—and some don't.

South Mimms, Hertfordshire. V. J. DOWNIE.

INTRAVASCULAR CLOTTING IN EXPERIMENTAL HÆMORRHAGIC SHOCK

SIR,—In 85 New Zealand rabbits significant changes in many clotting factors and in the overall blood-clotting mechanisms followed the removal of blood (40 ml. per kg. body-weight) rapid enough to induce reversible shock. The phenomena observed could be divided in three major phases.

During and in the first half-hour following hæmorrhage (*early phase*) the plasma-fibrinogen level, the serum-complement titre, and the labile-factor (factor-V) activity dropped rapidly. On the other hand, the number of platelets doubled and the speed of formation and the total yield of plasma-thromboplastin were increased. The latter finding was apparently due to the development of a potent accelerator of clotting, since the addition of serum from the animal in shock to a system in vitro containing normal platelets and normal plasma resulted in a much more rapid formation and increased yield of plasma-thromboplastin than when normal serum was used. Also an experiment in vivo was devised in which normal rabbits received homologous thrombin-free serum from 50 ml. of

blood. Only minor acceleration in the formation of plasma-thromboplastin followed when the serum was from normal animals. The injection of serum from animals in hæmorrhagic shock, on the other hand, induced more rapid and complete formation of thromboplastin.

As the shock deepened, even after arrest of bleeding and for as long as twelve to twenty-four hours afterwards, different findings developed (*late phase*). While the fibrinogen level continued to drop, platelets also became drastically reduced and the formation of thromboplastin was slow and incomplete.

This phase was followed by a *period of recovery*, of two to three days' duration, during which all factors returned to normal. Histologic sections taken between the third and the seventy-second hour showed deposition of material with the morphological and staining properties of fibrin into some of the venous vessels of the lung, kidney, and liver.

Analytical study of the fibrinolytic system suggested activation in vivo in the early phase because of considerable increase in the titre of antifibrinolysin and sharp decrease in the activity of profibrinolysin possibly consumed in vivo. In the later phase, on the other hand, the serum profibrinolytic activity rose and that of antifibrinolysin decreased, suggesting a return of the fibrinolytic mechanism to normal.

Splenectomy within three weeks before hæmorrhagic shock prevented most of the changes described or reduced their severity. No clot accelerator developed in the splenectomised animals during the early phases of shock.

Thus, significant intravascular clotting occurs in the early phase of hæmorrhagic shock. This statement is based on the findings of accelerated formation of thromboplastin because of the development of a clotting accelerator agent, appearance of thrombocytopenia, intravascular deposition of fibrin demonstrable by histologic techniques, and activation of the fibrinolytic mechanism. Since changes were minor in splenectomised animals, the splenic contraction which accompanies severe hæmorrhage may initiate intravascular clotting through the immission into the blood-stream of tissular thromboplastin or of thromboplastic material from the platelets lysed within the splenic sinusoids.

These results may have significant applications to human pathology. A severe bleeding tendency characterised by fibrinogenopenia, thrombocytopenia, and exalted fibrinolysis has been observed during massive surgical bleeding.[1] Earlier work suggested that the hæmostatic breakdown may be due in part to intravascular clotting. The results of the present work support this hypothesis.

Our investigation was supported by a grant-in-aid from the American Heart Association. Essentially similar (unpublished) findings have been obtained in dogs at this laboratory by Leo Gagliardi, Hector Marin, and Mario Stefanini.

Joseph Stanton Memorial Laboratories, Saint Elizabeth's Hospital, Boston, Massachusetts, U.S.A. MARIO STEFANINI RINALDO A. TURPINI.

PHYSICAL CHANGES IN THE PROLAPSED DISC

SIR,—May I suggest that much of the difference of opinion expressed in this correspondence is due to failure to distinguish the fundamental differences between a normal disc and a pathological one.

The "disc material" one removes at operation, either for "disc prolapse" or "disc degeneration", has physical properties entirely different from those of a normal disc. It is very similar to the abnormal disc material found in proximity to an early subepiphyseal tuberculous focus—i.e., it is solid "stringy" material, aptly described as "crab meat". A normal nucleus pulposus is, of course, fluid—usually under considerable pressure. If one compresses longitudinally two normal vertebræ and the intermediate disc, the bone collapses before the annulus ruptures. Prolapse of a normal disc either never or hardly ever occurs. It is only when the nucleus pulposus has lost its normal characteristics—probably through poor nutrition subsequent to ischæmia, secondary to infection or trauma—that prolapse of disc material takes place. Examination of such material does not tell one the properties of normal nuclear fluid.

Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry, Salop. ROBERT ROAF.

AUTO-ANTIBODIES IN THYROID CARCINOMA

SIR,—The letter by Dr. Stuart and Dr. Allan (July 5), reporting the presence of high-titre thyroid auto-antibodies in 3 out of 6 cases of carcinoma of the thyroid, raises an important issue if serological tests are to be more widely used as an aid in the differential diagnosis between Hashimoto's disease and thyroid cancer. Our experience in this connection may therefore be of interest.

Thanks to the cooperation of Prof. D. Waldron Smithers and Dr. N. Howard, of the Royal Marsden Hospital, Mr. B.

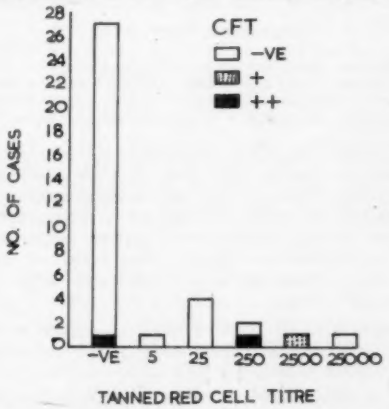


Fig. 1—Thyroid auto-antibodies in cancer of the thyroid. Tanned-cell hæmagglutination titres are expressed as the reciprocal of the highest serum dilution giving a one + agglutination. A single pipette was used for the serial dilutions of serum. Complement fixation (CFT): +, complete inhibition of hæmolysis at serum dilution of 1/5; ++, complete inhibition of hæmolysis at dilution of 1/20 or higher.

Truscott, of Addenbrooke's Hospital, Mr. A. S. Till, of the Radcliffe Infirmary, and several others, and by studying patients in the Middlesex Hospital, we have been able to investigate serologically 36 cases of proved thyroid malignancy. The sera were tested by the passive hæmagglutination of tanned cells coated with purified thyroglobulin, by complement fixation against thyrotoxic thyroid extract,[1] and by the precipitin reaction in agar. The results are shown in fig. 1. Auto-antibodies were found in 10 of the 36 cancer patients; the tanned-cell titres did not exceed 25,000 in our series and we have not so far obtained precipitins in a patient with thyroid cancer. Only 4 of the 36 patients had complement-fixing antibodies.

Of 44 cases of histologically proved Hashimoto's disease examined by the same series of tests (fig. 2), all but 2 patients had circulating thyroid antibodies and 28 had levels sufficiently high to give precipitins. Complement fixation was positive in all but 6 cases.

The presence of antibodies in the cancer cases probably

1. Stefanini, M. Proceedings of the VIIth congress of the International Society; p. 78. Basle, 1956.

1. Trotter, W. R., Belyavin, G., Wadhams, A. *Proc. R. Soc. Med.* 1957, **50**, 961.

reflects lymphadenoid changes surrounding the tumour, a known histological feature. One would expect to find a high level of circulating antibodies where cancer is associated with widespread thyroiditis, as in the cases reported by Dr. Stuart and Dr. Allan. In such cases, however, clinical features and other thyroid investigations often reveal the presence of a tumour. In many cases the character of the swelling or the presence of secondary glands make the diagnosis obvious, while topographical survey of the ^{131}I uptake over the thyroid shows deficient or absent pick-up over the majority of malignant

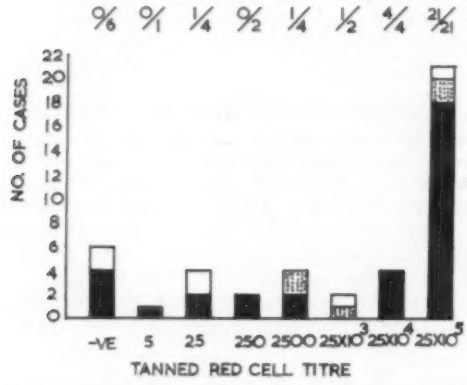


Fig. 2—Thyroid auto-antibodies in histologically proved Hashimoto's disease. Tests done before or within 3 weeks of operation. Results are expressed as in fig. 1. The proportion of patients having positive precipitins is shown above the appropriate column.

nodules. Most Hashimoto goitres involve the entire gland, even when one lobe is larger than the other, and the iodine uptake is greater on the side of maximum swelling. The B.M.R. and serum-cholesterol may be of help since hypothyroidism is very uncommon in thyroid cancer and frequent in lymphadenoid goitre. The rapid regression of Hashimoto goitres under thyroid medication is another feature of diagnostic value.

We agree with Dr. Stuart and Dr. Allan that serological tests should be interpreted only in conjunction with careful clinical assessment and other available investigations; but only a more extensive study of goitre patients, especially those undergoing thyroidectomy, will show whether a differential diagnosis can be made with confidence on the basis of these combined criteria.

DEBORAH DONIACH
I. M. ROITT
R. VAUGHAN HUDSON.

The Middlesex Hospital, London, W.1.

ARTIFICIAL RESPIRATION

SIR,—In your annotation on this subject [1] you say:

"Even with intubation Safar et al. did not succeed in moving more than 700–260 c.cm. of air with either the Holger-Nielsen or the Silvester method. This is far below the ventilation regularly attained in the investigation of Gordon et al., but the reason for this difference is not clear."

When a tracheal tube was in place, we moved with the Holger-Nielsen method in 5 curarised subjects tidal volumes of 260–840 c.cm. (average 655 c.cm.)—the small tidal volumes in obese subjects, the large tidal volumes in lean subjects. Our subjects were lying on a hard table. Gordon moved approximately 1000 c.cm. per breath in tall, lean, and healthy volunteers, who were lying on the floor. Our small tidal volumes are easily explained by the reduced chest distensibility, since some of our subjects were heavy and short. Our large tidal volumes are smaller than Gordon's because our subjects were lying on a table. The small tidal volumes are not surprising in view of the findings of other investigators—namely Nims et al.,[2] Waters and Bennett [3]—who could move only 140–280 c.cm. per breath with these push-pull methods and with a tracheal tube in place; they studied apnœic patients who were obese or whose lung-chest distensibility was reduced by disease.

Without tracheal tube 11 of 15 subjects (lying on the floor) could not be ventilated with the Holger-Nielsen method, because of upper airway obstruction. This was confirmed recently by Gordon et al.,[4] who were unable to ventilate 40–50% of the curarised subjects studied when they did not use a tracheal tube.

We learned from a separate study of unconscious patients who were not curarised that pharyngeal obstruction by the tongue due to flexion of the neck and sagging of the mandible is at least as common in the prone as in the supine position, even when an artificial oropharyngeal airway is in place. The Esmarch-Heiberg manœuvre (extension of the neck plus forward displacement of the mandible) seems to be the single most important point in respiratory resuscitation.

You remark on successes known to have followed use of the Holger-Nielsen and Silvester methods. But who knows whether an asphyxia victim in the field survives in spite of or because of the method applied? Many comatose asphyxiated patients have been awakened by external stimuli only. Airway obstruction is unpredictable. There is no doubt that occasionally the airway is open during performance of the push-pull methods; but the rescuer is unable to recognise movement of air while working on the patient's chest.

You suggest that dizziness may affect the operator while performing mouth-to-mouth breathing. We confirmed Elam's data.[5]

The rescuer could perform mouth-to-mouth breathing for 30 minutes or longer without becoming dizzy. Whenever he felt dizzy he automatically reduced the rate of inflations, and levelled off at an end-expiratory carbon-dioxide level of 3–4%, while that of the subject was 4–5%. The oxygen saturation and the end-expiratory carbon-dioxide level in the subject were maintained at normal levels with tidal volumes at least twice as large as normal at a rate of 10 inflations per minute or more. The restricting factor in prolonged mouth-to-mouth breathing is not dizziness of the operator, but fatigue of his back and hands.

A motion picture on *Respiratory Resuscitation Techniques*, which was made during one of our experiments, shows the experimental techniques and results better than a paper. The motion picture may be borrowed from Army Medical Institute of Research, MAVD, Walter Reed Hospital, Washington, D.C. (Attention: Sergeant H. Dixon).

PETER SAFAR
Chief, Department of Anesthesiology.

Baltimore City Hospitals, Baltimore, Maryland.

OOPHORECTOMY AND BREAST CANCER

SIR,—Your leader of July 12 refers in passing to the variable persistence of œstrogen excretion following bilateral oophorectomy and adrenalectomy for breast cancer.

I think it worth calling attention to a simple and practical possibility that may repay exploration, before some mysterious third source of œstrogens is postulated or sought—namely, the ovarian hilus cells. These (which resemble Leydig cells and

1. *Lancet*, 1958, i, 1322.

2. Nims, R. G., Conner, E. H., Botelho, S. Y., Comroe, J. H., Jr. *J. appl. Physiol.* 1951, **4**, 486.
3. Waters, R. M., Bennett, J. H. *Anesth. Analg.* 1936, **15**, 151.
4. Gordon, A. S., Frye, C. W., Gittelson, L., Sadove, M. S., Beattie, E. J., Jr. *J. Amer. med. Ass.* 1958, **167**, 320.
5. Elam, J. O., Brown, E. S., Elder, J. D., Jr. *New Engl. J. Med.* 1954, **250**, 749.

are invariably present) are found throughout the mesovarium, and extend medially along the ovarian ligament. The recent monograph of Morris and Scully [1] gives an account of them, together with evidence that they can produce œstrogen: an earlier review is that of Sternberg.[2]

Experience shows that oophorectomies for breast cancer vary: sometimes the operator seems bent on removing nothing whatever except the ovary, whilst at other times a generous slice of mesovarium is included. This may account for the variations noted. It seems clear that as much mesovarium and ovarian ligament as possible ought to be removed, and a tentative case might be made for bilateral removal of the adnexa.

London, W.C.1. P. E. HUGHESDON.

SKIN REACTION INHIBITED BY X-RAY THERAPY

SIR,—The following case is reported in the hope that some useful explanation may be obtained:

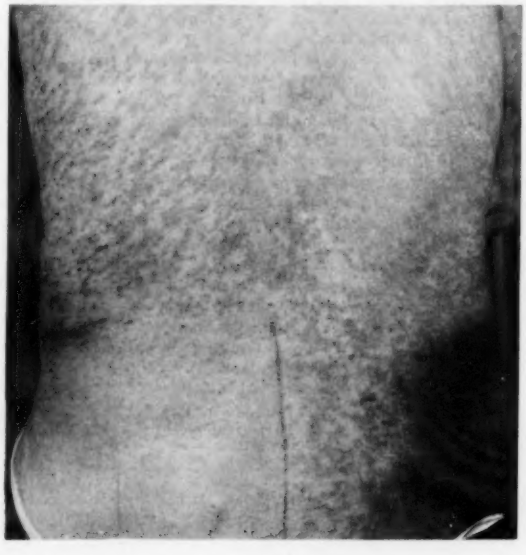
A man, aged 63 years, was admitted with a history of four months' pain in the left buttock. X-ray examination showed a large osteolytic lesion in the right ilium, which was diagnosed as a secondary deposit from a carcinoma of the prostate. The gland was enlarged, hard and irregular. The patient complained of moderately severe pain in the buttock three minutes after the intravenous injection of 250 mg. of stilbœstrol diphosphate ('Honvan'). There were no other positive findings.

On April 14, 1958, he started on a palliative course of deep X-ray therapy (190kV 300r daily skin dose to a field 20 cm. × 15 cm.). He had no treatment on April 19 and 20. On April 21 he awoke with a patchy macular rash on his trunk, thighs, and arms. There were also a few spots on his forearms and legs. The area being treated by X rays was completely clear and showed no evidence of the rash or of radiation erythema. The borders of the treated area were fairly sharply demarcated; if anything, the unaffected region tended to spread outside the blue lines used to delineate the area for treatment. Owing to the curvature of the buttock some of the radiation was likely to fall outside the prescribed rectangle, particularly at its medial and lateral sides.

The accompanying photograph was taken on April 22, by which time there was a faint suggestion of erythema in the irradiated area but certainly no blotchy rash. The patient was then given antihistamine drugs, and the X-ray therapy continued. The rash disappeared the next day. The cause of the rash is unknown. Perhaps it was due to an aspirin tablet he took the day before, perhaps to an enema.

A presumably allergic reaction seems to have been inhibited by a dose of 1500r in five days, and this inhibition occurred before any skin response to irradiation could be seen.

1. Morris, J. McL., Scully, R. E. Endocrine Pathology of the Ovary; chapters 2 and 6. London, 1958.
2. Sternberg, W. H. *Amer. J. Path.* 1949, **25**, 493.



St. Luke's Hospital, Dublin. JOHN B. HEALY.

SHOULD BIBLIOGRAPHIES GIVE TITLES OF PAPERS?

SIR,—I should like to add my plea to Mr. Patey's (July 19) that bibliographies should include titles of papers. This is particularly important in review articles.[1] The references are quoted with more care; the bibliography itself makes interesting reading. These and other advantages easily compensate for the exclusion of a short article.

With too much to read, I value quality before quantity.

Medical Unit, The Royal Infirmary, Cardiff. PAUL FOURMAN.

NON-ADRENAL FEMALE PSEUDO-HERMAPHRODITISM ASSOCIATED WITH HORMONE ADMINISTRATION IN PREGNANCY

SIR,—Attention has recently been drawn to the occurrence of partial virilism in female infants when the mother has received hormonal treatment during the pregnancy for repeated miscarriages or hæmorrhage during pregnancy. Lawson Wilkins and his colleagues [2] from the Johns Hopkins Hospital have collected 18 instances of this condition as well as 3 exactly similar in which the mother had received no hormones. Other instances have been reported by Hayles and Nolan [3] and by Nellhaus.[4] Wilkins has made a plea for smaller dosage of steroids and for the deferment of treatment until after the tenth week of pregnancy.

My colleagues and I at The Hospital for Sick Children, Great Ormond Street, have seen 3 such babies in the past year or so. They will be more fully reported elsewhere (with due acknowledgment to all who have contributed), but as the degree of masculinisation appears clearly in these to be related to the intensity and date of starting treatment they are briefly reported here.

CASE 1.—Aged just over three years on admission, this child, registered as a male, had a phallus with a urethral opening beneath it, and a scrotal-like structure with a median raphe but no testicles. Investigations excluded adrenal abnormality, and female sex was indicated by the nuclear chromatin in the white blood-cells. Laparotomy showed a normal uterus, fallopian tubes, and ovaries but absence of a vagina. In view of repeated miscarriages the mother had been given (as soon as she was known to be pregnant) tablets containing ethinylœstradiol 0·01 mg. and methyltestosterone 3 mg. twice daily for one month and three times daily for two months. She also had an implant of progesterone (50 mg.) in the third month and again in the fourth month of pregnancy.

CASE 2.—Aged nine days on admission, this child, of whom the sex had been considered doubtful at birth, showed an enlarged clitoris with a urethral opening on its under surface, and fused labia with a small vaginal orifice. There was no evidence of adrenal abnormality. Female sex was established by the nuclear chromatin of the white blood-cells. Examination under anæsthesia showed a wide vagina and normal cervix.

1. Waymouth, C. *Nature, Lond.* 1956, **177**, 98.
2. Wilkins, L., Jones, H. W., Holman, G. H., Stampfel, R. S. *J. clin. Endocrin.* 1958, **18**, 559.
3. Hayles, A. B., Nolan, R. G. *Proc. Mayo Clin.* 1958, **33**, 200.
4. Nellhaus, G. *New Engl. J. Med.* 1958, **258**, 935.

From the sixth week of pregnancy the mother had taken six tablets a day containing 0·01 mg. of ethinylœstradiol and 10 mg. of ethisterone until she was delivered by cæsarean section at the thirty-eighth week.

CASE 3.—This child, admitted at the age of four weeks, was noted to have a large clitoris at birth, confirmed on admission. Examination showed the presence of a vagina and a small uterus; the ovaries were probably felt. There was no evidence of adrenal abnormality and female sex was confirmed by the nuclear chromatin in the white blood-cells. The mother had received tablets of methyltestosterone 10 mg. three times a day for three weeks about the third month of pregnancy for vaginal bleeding and again at about the sixth month for about six weeks for the same reason. Seen at one year of age this child showed a clitoris only slightly larger than normal.

These three cases have been set out in order of severity. In case 1 the mother received the earliest and most intensive treatment, but even in case 3 the mother was not treated until the third month. It may be, as Lawson Wilkins and his colleagues remark, that these children might not have been born at all but for the treatment; but in view of the psychological and other problems presented they appear to support the plea for not starting it too early and keeping the dosage as low as possible.

The Hospital for Sick Children,
Great Ormond Street,
London, W.C.1. ALAN MONCRIEFF.

P.S.—Since submitting this letter, I have read an annotation in the *British Medical Journal* (July 26, p. 218) which suggests postponing hormone treatment until after the fourth month.—A. M.

INTERFERENCE WITH TELEVISION

SIR,—I happen to live in the vicinity of Harley Street and to possess a television set. The only time I *try* to look in in the afternoon is when show jumping and Wimbledon are on. It is quite impossible to ask anyone to share this pleasure with me because some selfish doctor or nursing-home turns on a machine without a suppressor, which, apart from causing a tremendous roar, completely obliterates the picture. The Post Office say that they cannot force anyone to add a suppressor (which I believe costs half-a-crown) and that they have more complaints from around here than in any other area.

London, W.1. ENID DOUGLAS DERRICK.

HÆMOPHILIA-LIKE STATES IN GIRLS

SIR,—Professor Quick and Miss Hussey,[1] when they discuss hæmophilia-like states in girls, have omitted mention of the cases of hæmophilia in human females which occurred in the family originally described by Treves [2] and subsequently by Bulloch and Fildes,[3] by Handley and Nussbrecher,[4] and by myself.[5] One does not expect authors to review the whole of the published literature each time they write a case-report, but this family is unique in two ways. Firstly, the family studies extend over a very long period; and secondly, this family is probably the first in whom the diagnosis of hæmophilia was established in females with any degree of certainty. Quick and Hussey are clearly aware of these reports since they mention them in other publications.[6 7]

They have objected to the diagnosis of hæmophilia because of the alleged male-to-male inheritance in the first four generations and also because hæmophilia-like disease was not excluded. Their first objection I have already discussed in detail.[5] It is no longer possible to prove or disprove this inheritance since the patients all died very many years ago; the history of bleeding in them is very scanty and often amounted to no more than a tradition in the family that they were bleeders. The inheritance in recent years is typical of hæmophilia.

Their second objection was possible but improbable. Blood of hæmophiliacs from 3 different families was used in testing this family. It was possible to deduce the fact that at least 2 hæmophiliacs with different clotting-times were used [5]; they were consequently probably unrelated. The fact that 3 unrelated hæmophiliacs were used did not appear to be important at the time and so was not mentioned. These three hæmophiliacs are now known to have classical hæmophilia. It would be unlikely that an error in the diagnosis of hæmophilia would have been made in all these cases. In any case the matter has been put beyond doubt by the statement of Taylor and Biggs [8] that later work has shown that the family described in my paper have classical hæmophilia.

Groote Schuur Hospital,
Cape Town. C. MERSKEY.

PREVENTION OF POSTOPERATIVE TETANUS

SIR,—Professor Pannett [9] criticised the use of the tourniquet in limb operations, a routine which he regards as a harmful and backward step in surgery. He quotes two unjustifiable risks associated with the use of a tourniquet: (1) damage to nerves and muscles; and (2) lowering of tissue resistance to infection. At the time his letter was published a married woman, aged 39, died in Melbourne from tetanus contracted during an operation of election—namely, a meniscectomy—in which a tourniquet was used. This case and its circumstances are pertinent to Professor Pannett's letter and to your editorial comments [10 11] on the importance of efficient ventilation in operating-theatres.

The infection was a fulminating one and death occurred three days after a short incubation period of five days. *Clostridium tetani* and *Cl. sporogenes* were isolated at necropsy, and during life from fluid inside the knee-joint and from the surrounding tissues. The sterilisation of the instruments, textiles, dressings, talc, &c., was carried out efficiently with tested equipment. The operating-theatre and sterilising annexe were connected by a sliding door which is kept open during the setting-up for an operation and both rooms were ventilated by means of exhaust fans placed in large ducts opening in the ceiling. These ducts were protected by a wide-mesh wire guard and could not be cleaned except by unscrewing the guard. As might be expected, they were heavily laden with dust. Cultures from the dust in each yielded various species of clostridia, including a non-toxigenic strain of *Cl. tetani*.

When the fan in the sterilising annexe is operating, air is sucked into the theatre through its dust-laden duct or from the corridor, and vice versa. When the fans are not operating air currents set up by external wind or by convection pass along the ducts providing a further opportunity for dislodging dust. Since the sterilisation was adequate it can only be assumed that this infection developed from dust contamination of the wound or the instruments during the operation. To what extent the use of a tourniquet and a tight bandaging of the wound thereafter contributed to tissue anærobiosis is difficult to say. However, this case raises several interesting points.

In the past five years in Victoria there have been 56 notified cases of tetanus, of which 6 (about 11%) followed operations of election. Of these 6 cases, 3 were operations on the knee or ankle joints. Sevitt [12] reported 2 hospital-infected cases, both involving operations on the leg, and he also described [13] a

1. Quick, A. J., Hussey, C. V. *Lancet*, 1958, i, 1294.
2. Treves, F. *ibid*. 1886, ii, 533.
3. Bulloch, W., Fildes, P. Treasury of Human Inheritance; parts v and vi, p. 169. University of London, Francis Galton Laboratory for National Eugenics, 1911.
4. Handley, R. S., Nussbrecher, A. M. *Quart. J. Med.* 1935, **4**, 165.
5. Merskey, C. *ibid*, 1950, **20**, 299.
6. Quick, A. J., Hussey, C. V. *Amer. J. Dis. Child.* 1953, **85**, 698.
7. Quick, A. J. Hemorrhagic Diseases; p. 186. London, 1957.
8. Taylor, K., Biggs, R. *Brit. med. J.* 1957, i, 1494.
9. Pannett, C. A. *Lancet*, 1958, i, 585.
10. *ibid*. 1953, ii, 1133.
11. *ibid*. 1956, ii, 39.
12. Sevitt, S. *ibid*, 1949, ii, 1075.
13. *ibid*, 1953, ii, 1121.

case of gas gangrene after an operation on the ankle. Of the 4 postoperative tetanus deaths in England and Wales in 1954 2 followed operations on the foot.[14] Since such operations must constitute only a small fraction of the total surgical load they seem to carry an unexpectedly high risk of tetanus. In contrast to the present trend, Wainwright [15] reported, from a survey of tetanus over twenty years, that, while postoperative tetanus accounted for 10% of civilian cases, 70% followed gynæcological and abdominal operations.

Although postoperative tetanus is an uncommon disease, the case-fatality rate is high (about 44% in Australia).[16] In its elimination as a surgical hazard, four levels of prevention, two general and two specific, can be considered.

The first is the intelligent use of efficient sterilisation equipment recommended by Bowie,[17] a factor which does not require comment here.

The second is concerned with effective ventilation of operating suites using filtered air and a plenum system, based on the principles described by Bourdillon and Colebrook [18] and more recently by Blowers.[19]

The third lies in the more conservative use of tourniquets, as suggested by Professor Pannett.

The fourth is to immunise patients with tetanus toxoid before all elective operations of the lower limbs in which tourniquets are used, particularly those involving the knee or ankle joint. If the patient has not been actively immunised, two injections, one four weeks before and another at the time of operation, would not seriously interfere with the management of a case. The individual who has been actively immunised may be given a preoperative booster injection of toxoid. In emergency operations of the type being discussed prophylactic antitetanus serum followed by active immunisation during convalescence would be a useful safeguard.

While dealing with the subject of selective immunisation in non-traumatic surgery it might be suggested, on the analogy of passive transfer of immunity in diphtheria,[20] that neonatal tetanus, which accounted for 4·9% of cases in an Australian series [15] and 3·4% of deaths from tetanus in England,[21] could be abolished by active immunisation of the mother during pregnancy.

Finally, as more individuals are now being actively immunised against tetanus [22] a clear distinction should be drawn *for the patient* between active and passive immunisation. We recommend that individuals who are given tetanus toxoid be informed, verbally and perhaps in writing, that the immunisation was a " T.T. injection " and when antitoxin is used it is always referred to as an " A.T.S. injection ".

School of Bacteriology,
University of Melbourne,
Victoria, Australia.

SYDNEY D. RUBBO.

CHARGES FOR NIGHT CALLS

SIR,—In your leading article of July 5, you described the National Health Service as simply a legislative device by which doctors can continue their work without charging fees; and this was the most attractive part of it to most doctors whether they actually approved of the service or not. But after a very short time, the Socialist Government which had sponsored this free service put a charge on drugs and appliances as a deterrent, and I think that was quite wrong. The collection of these charges must have caused considerable misgivings to chemists and opticians and others who had to collect this payment from some patients who could ill afford it.

Dr. Guy Dain, who always expressed himself as being wholeheartedly in favour of a comprehensive medical service available to 100% of the population, has now suggested [1] that " it would probably remove some disgruntlement if the doctor could make a charge (to be fixed) for late and night calls for visits ". What amount would Dr. Dain suggest, I wonder, as the fee for a late call and for a night call? Is the same fee to be applicable to all classes, irrespective of their income group and irrespective of whether they are old-age pensioners? Is the fee to be retained by the practitioner himself, or will he be merely collecting it on behalf of the Treasury, in view of the fact that this charge, like the charges on prescriptions and appliances, is intended as a deterrent.

Many doctors working in the service today have never worked in the times when doctors charged fees to patients, and probably have no desire to do so now. I think it would cause considerable embarrassment to a young doctor if he had to demand a fee from a patient who had been taken ill in the night, or even from anxious relatives. If, from time to time, additional fees are to be charged to patients in order to deter them from using the National Health Service, it makes a nonsense of the whole scheme, and it would be better to return to the old system where patients made their own arrangements.

Camberley. LESLIE HARTLEY.

THE DAY HOSPITAL

SIR,—The excellent article by Dr. Craft (July 19) on the treatment of depressive illness at the Maudsley Hospital shows a higher rate of recovery in patients treated in the day hospital than those treated in the adjoining inpatient hospital. The investigation would have been even more useful, however, if it had been undertaken as a piece of interdisciplinary operational research including the contributions of a sociologist and a cost accountant.

Mental illness involves interpersonal relationships at home and at work. There is less disturbance of family relationships when the patient still lives at home than when he goes into hospital, and this may well contribute to increased speed of recovery. Again, he will probably find it easier to resume work or obtain a new job if he has been attending a day hospital than if he has been an inpatient; but as yet these points have not been compared sociologically.

Equally important is the economic aspect of day hospitals, where comparable medical care can be given at a substantially lower cost than in an ordinary hospital. It is regrettable that in the most recent Ministry publication on hospital costing there is no breakdown of the comparative costs of care of Maudsley Hospital inpatients and those in the adjoining day hospital. The comparison may well be difficult, but this is the type of problem that is dealt with daily by industrial cost accountants.

In the years to come, day hospitals will probably have an increasingly important role in the treatment of non-catastrophic illness, and their development may well influence the whole concept of hospital design and medical care in urban areas. Such changes can be justified only by comprehensive research which, under present financial conditions, can most easily be undertaken by teaching hospitals, and must include the social and economic needs of the family and of the community.

Marlborough Day Hospital,
38, Marlborough Place,
London, N.W.8. THOMAS M. LING.

14. *Brit. med. J.* 1957, 594.
15. Wainwright, J. M. *Arch. Surg.* 1926, **12**, 1062.
16. Johnston, D. W. *Med. J. Aust.* 1956, i, 710.
17. Bowie, J. H. *Pharm. J.* 1955, **174**, 473, 489.
18. Bourdillon, R. B., Colebrook, L. *Lancet*, 1946, i, 561, 601.
19. Blowers, R. Symposium on Hospital Coccal Infections, 1957, no. 14.
20. Barr, M., Glenny, A. T., Randall, K. J. *Lancet*, 1949, ii, 324.
21. Conybeare, E. T., Logan, W. P. D. *Brit. med. J.* 1951, i, 504.
22. Scott, T. L. *ibid.* 1958, i, 1176.

1. *Brit. med. J.* July 5, 1958, suppl. p. 1.

ORAL TREATMENT OF PERNICIOUS ANÆMIA

SIR,—I should like to comment upon some aspects of the challenging article by Dr. Heathcote and Dr. Mooney.[1] They state that they have isolated a vitamin-B_{12}-peptide from a streptomyces fermentation "shown clinically to be the most effective oral preparation yet available" for the treatment of pernicious anæmia. The "failure of simple proteolysis in the stomach" to which they refer, seems unlikely to be of ætiological importance in that disease, but a vitamin-B_{12}-peptide might well be physiologically significant in the transport of vitamin B_{12} across the intestinal wall. Consequently it is disappointing to find that the authors have submitted no convincing evidence that their vitamin-B_{12}-peptide was more active hæmatopoietically than its content of vitamin B_{12}.

Thus, as pointed out by Dr. Latner,[2] the high vitamin-B_{12} content alone (100 μg.) of the peptide given daily during the initial stage of the therapy of each patient may have produced the remissions noted. Failure to relapse thereafter during a few months of reduced maintenance therapy is notoriously poor evidence of therapeutic activity. Even if Dr. Heathcote and Dr. Mooney's claim for the therapeutic efficacy of their vitamin-B_{12}-peptide is accepted, the conclusion that "intrinsic factor does not exist" seems irrelevant.

In their reply[3] to Dr. Latner's letter, Dr. Heathcote and Dr. Mooney express lack of confidence in the interpretation of "short-term responses". If by that phrase they refer to carefully controlled observations upon serial reticulocyte responses during successive 10 to 14 day periods of uniform daily therapy in individual patients, it may be of more than historical interest to point out that it was in large part with the aid of such a clinical index that therapeutically effective liver extracts were originally developed and that the clinical activity of vitamin B_{12} itself received final confirmation. Indeed, by such methods the activity of the so-called gastric intrinsic factor was first demonstrated. Since then its more convenient assay by comparative observations upon the assimilation by individual patients of small single doses of radioactive vitamin B_{12}, first without and then with intrinsic factor, has become an established practice.

In my opinion, until such comparisons in the same patient are appropriately applied to the present problem, first employing single doses of not more than 5 μg. of vitamin B_{12} alone, the alleged superior hæmatopoietic activity in pernicious anæmia of the vitamin-B_{12}-peptide over that of its content of vitamin B_{12} will remain uncertain.

Harvard Medical School,
Cambridge, Massachusetts. W. B. CASTLE.

RECORDS OF IMMUNISATION

SIR,—I am prompted to write by Dr. Carson's letter of July 19. If the wear and tear on my Post Office Savings book is any criterion, I hope that Dr. Carson's (or are they Burroughs Wellcome's?) cards are made of a highly durable synthetic plastic.

Chirk,
North Wales. R. P. W. KUP.

RADIOGRAPHERS IN THE N.H.S.

SIR,—Since you wrote on this subject, over a year ago,[4] the shortage of radiographers appears to have increased steadily, with little further mention of the fact in print. Medical staff of hospitals where the radiological service is necessarily drastically reduced are naturally asking what is being done and what are the prospects of restoring a proper service.

As there is a limit to what can be done by the heroic devotion of radiographers, the understaffed departments are faced with the unavoidable choice of foregoing the less urgent types of examination (and who is to decide which are these?) or of employing unqualified personnel.

A somewhat similar situation during the war was met by the Services training their own radiographers to an acceptable minimal standard, and I fear that stark necessity may shortly force some hospitals and chest clinics to train local labour to undertake the simpler radiographic examinations by rule-of-thumb methods. Once started, such a practice would be difficult to stop, and it might well lead to degrading of radiographic standards generally unless arranged under the direction of the Society of Radiographers.

Understaffed X-ray departments would welcome an authoritative statement about the present and future position of radiography.

Ashford Hospital,
Ashford, Middlesex. J. A. BROCKLEBANK.

DURATION OF PREGNANCY

SIR,—The duration of pregnancy, measured in days or lunar months, varies considerably from one "normal" baby to another, and so prediction of the date of birth is subject to error even in normal pregnancies. The average length of gestation is accurately known: to apply this to an individual case, some correction is required for the "time-scale" of the particular mother and child. The late Dr. W. E. Dickes Rost suggested in her unpublished notebooks that the required correction might be made by substituting the length of the mother's periods for the lunar month, as the unit of time. It was hoped that calculation of the expected length of pregnancy as ten times the length of the mother's periods would be more accurate than the present system. It has already been reported that the incidence of abortion shows peaks at intervals of about $4^1/_2$ weeks.[1]

Department of Anatomy,
University of Sydney,
New South Wales. F. W. DICKES ROST.

FLAMMABLE CLOTHING

SIR,—I can fully appreciate the disappointment expressed by Mr. Willby (July 26, p. 217), press officer to the British Standards Institution, at the discussion on flammable clothing at the meeting of the British Medical Association in Birmingham, for it is quite possible that many of the speakers confused the B.S.I. with the British Government. Many of us who work in burns centres are dissatisfied not so much with the B.S.I., which does very good work within its very definite limitations, but rather with a Government which, in spite of the recommendations made in the B.S.I. report, has done virtually nothing to popularise the existence of attractive flame-resistant clothing fabrics or to encourage their manufacture and sale at a reasonable price, even though this might require a special, though probably only temporary, Government subsidy, as recommended by Colebrook et al.[2]

Experience in South Wales over the past two and a half years has shown that many big departmental stores or shops still refuse to stock flame-resistant fabrics: some may have the fabrics in stock, but will not display them because of their high price. Even more staggering are the popular misconceptions held by directors, buyers, and departmental managers, let alone the sales staff, about the relative flammability or safety of different fabrics. It is

1. *Lancet*, 1958, i, 982.
2. *ibid.* p. 1077.
3. *ibid.* p. 1177.
4. *ibid.* 1957, i, 1030.

1. Pearce, T. V. *Biometrika*, 1930, **22**, 250.
2. *Brit. med. J.* 1956, i, 1379.

thus very distressing to find that a good deal of one's personal effort and that of the various home-safety committees in encouraging parents to ask for flame-resistant fabrics is wasted by apathy or ignorance in the retail trade.

Welsh Regional Plastic Surgery,
Burns and Jaw Injuries Centre,
St. Lawrence Hospital, Chepstow. MICHAEL N. TEMPEST.

NEOLOGOPHILIA

SIR,—To the two (or perhaps three) reasons for learning Greek given by Dean Gaisford we must now add another: to allow us to understand the less literate contributions to medical journals. Yet I doubt if Bentley himself would have guessed that thalassæmia is not a perfusion with sea water but an inherited abnormality of hæmoglobin. The neologopoietic author ought to use his Liddell and Scott with care: even a simple word like anæmia meant something different to Homer.

Your own contribution, Sir, to this discussion (July 26, p. 215) is regrettable. Greesham's Law is as valid in journalism as in finance. You may not be guilty of counterfeiting but to put this verbal snide into circulation is a crime just as grave.

Hoccombe Bottom,
Somerset. J. A. BOYCOTT.

Parliament

Children's Bill

THIS Bill [1] includes a provision that in considering whether to make an adoption the court shall have regard "to the health of the applicant". At the report stage on July 25 in the House of Commons, to this provision were added the words "as evidenced, in such cases as may be prescribed, by the certificate of a fully registered medical practitioner". Some members regretted that the amendment did not go further and make medical testimony compulsory. Miss PATRICIA HORNSBY-SMITH, parliamentary secretary to the Home Office, gave an assurance that the Lord Chancellor intended to make rules requiring a medical certificate in most cases. But he did intend to except some cases, when, for instance, the applicant was the mother of the child.

The Bill was read a third time.

QUESTION TIME

Suicides and Attempted Suicides

Mr. KENNETH ROBINSON asked the Home Secretary if he had yet reached a conclusion on the desirability of amending the law relating to suicide and attempted suicide.—Mr. R. A. BUTLER replied: No, Sir. My study of this question suggests that in its practical aspects the problem is largely one of ensuring that those who need care or treatment to prevent them from endangering themselves or others in fact receive it. In general, where this can be done without the intervention of the courts proceedings are not taken, but there is a residue of cases in which the person concerned cannot be given, or will not accept, care or treatment without the intervention of the courts. I shall continue to study this aspect of the matter and I am in consultation with the Minister of Health.

Mr. ROBINSON: Is not the Minister taking rather a long time to reach a conclusion on a matter where the overwhelming weight of opinion is in the direction of reform? If the Government are not prepared to take the initiative in this matter, can he say what would be their attitude towards the initiative being taken by a private Member?—Mr. BUTLER: I cannot state what my attitude would be towards the initiative of a private Member until I know the nature of that initiative. I do not know whether the hon. Member is aware that the joint committee of the British Medical Association and the Magistrates' Association has commended the law and practice in Scotland in this matter. The reason I am not going any further in answer to the hon. Gentleman is that we are at present carefully considering that with a view to seeing what we might do about it.

Mr. CHARLES ROYLE: Will not the Minister hold out a little more hope in this matter, particularly as involved and responsible organisations are taking the view that they are? Cannot we get more in line with other countries who never regard attempted suicide as a criminal matter?—Mr. BUTLER: It so happens that in 1956, the last year for which I have figures, proceedings were taken in 613 cases of attempted suicide out of a total of over 5000, and only 6·7% of these proceedings resulted in sentences of imprisonment, and there is a certain limit to that. But I am considering the whole question.

More Dentists

The Ministry of Health, after consultation with the University Grants Committee, have accepted the recommendation of the McNair Committee that the annual output of dental schools in Great Britain needs to be expanded to produce at least 800 dentists who will practise in this country. To allow for wastage and students from overseas the schools' present potential intake of about 650 students per annum in their first professional year must be expanded to something over 900 places. The Ministers aim to start expansion as soon as possible; and, when considering projects for inclusion in the Government's programme for major hospital building schemes, they will give due regard, in consultation with the University Grants Committee, to proposals which will contribute to it.

Working Party on Hospital Medical Staffing

Mr. ARTHUR BLENKINSOP asked the Minister of Health how many of the members appointed by himself and the Secretary of State for Scotland to the working party on medical staffing of hospitals had experience of the staffing problems of any other than teaching hospitals.—Mr. R. THOMPSON replied: All 6. 2 are currently serving in non-teaching hospitals; the other 4 are concerned in the health departments with the staffing problems of the hospital service as a whole.

Smoke Control

The Minister of Housing and Local Government has confirmed 34 orders establishing smoke-control areas. 13 orders are under consideration and a further 102 orders have been provisionally notified to him by local authorities.

1. See *Lancet*, 1958, i, 646.

Appointments

COUSTON, T. A., M.B. St. And.: assistant psychiatrist, St. Margaret's Hospital, Birmingham.
CUST, GEORGE, M.B. Leeds, D.P.H.: M.O.H., Cleethorpes and Grimsby.
FEE, W. M., M.B. Edin., D.P.H.: deputy M.O.H. and deputy port M.O., Greenock.
GARDEN, R. A., M.B. Glasg.: school M.O., Nottingham.
HUNTER, J. K., M.B. Glasg., D.T.M. & H., D.P.H.: assistant administrative M.O., Eastern Regional Hospital Board, Scotland.
TURNER, WILLIAM, M.B. Leeds, D.P.H.: senior assistant M.O. and school M.O., Ilkley, Otley, and Wharfedale, Yorkshire.

East Anglian Regional Hospital Board

BLACK, J. H. A., M.B. Belf.: registrar in psychiatry, Fulbourn and Addenbrooke's Hospitals.
CLARKE, H. L., M.B. Lond.: anæsthetic registrar, Newmarket General Hospital.
CRAGGS, D. F., M.B. Lond.: registrar in psychiatry, Fulbourn and Addenbrooke's Hospitals.
MACKENZIE, K. M., M.D. Lond., M.R.C.P.: part-time consultant physician, West Suffolk General Hospital.
ROBERTS, J. H., M.B. Lpool: radiological registrar, Ipswich and East Suffolk Hospital.

Births, Marriages, and Deaths

BIRTHS

SMITH.—On July 19, to Kathleen Smith (née Turner), M.B., and Irvine Smith, F.R.C.S., at Burton-on-Trent—Christopher Fredric, a brother for Anne, Dorothy, and Geoffrey.

SHEMILT.—On July 25, at Salisbury Infirmary, Wilts, to Janet (née Brownscombe), wife of Philip Shemilt, F.R.C.S.—a daughter.

Obituaries

GEORGE MACFEAT WISHART

M.D., B.Sc. Glasg., F.R.F.P.S.

George Wishart gave Glasgow University forty years of effective and varied service as scientist, teacher, and administrator. He retired in 1947 from the chair of applied physiology to preside over the faculty of medicine, and the only flaw in his colleagues' and students' admiration for the dean was regret at the loss of the professor.

His father was a Glasgow grain merchant and he was educated at Uddingston Grammar School and the University of Glasgow, where he graduated B.Sc. and M.B. in 1918. After serving a year with the R.A.F. medical service he returned to the university as an assistant in the institute of physiology. Two years later he was appointed to the Grieve lectureship in physiological chemistry. He found time for postgraduate study in Sweden and Germany, and, nearer home, he spent several vacations working at the Hannah Dairy Research Institute during its early formative years. Much of the research of these early years was summarised in his authoritative M.D. treatise on basal metabolism, for which he was awarded the Bellahouston medal in 1926, and in his *Groundwork of Biophysics* which was published in 1931.

In 1935 Wishart was appointed to the Gardiner chair of physiological chemistry. As a teacher he was "almost deceptively good", as the Principal of the university put it in his tribute last week.

"Neither in the lecture-theatre nor elsewhere was he anything of an orator. But his words were so beautifully ordered that only when his students came to work over his material for themselves did they discover how difficult were some of these apparently simple ideas. In the laboratory he had swift curiosity, ingenious mind, and contriving hands, happily employed in the experimental work of the school on the borderland of the natural and the biological sciences."

In 1947 the faculty of medicine was faced with new duties and wider responsibilities; the new health service was to alter the administration of the teaching hospitals, and the opportunities for postgraduate education were to be extended. The faculty felt the need for the support and counsel of a full-time dean, and Wishart was their unanimous choice. He accordingly resigned his chair to take up his new appointment, to which he added the additional charges of directorship of postgraduate medical education in Glasgow and membership of the General Medical Council. Of his bearing and achievements in this new career J. W. H. writes:

"George Wishart set himself a programme of work which would have been beyond most men's will and energy. As Dean of the faculty, his leadership was truly that which aspired above all to serve. His colleagues know how well he served. Faculty meetings kept to the point and did not drag on until exhaustion produced resigned assent or snap decisions. On the contrary, the Dean saw to it that he was well prepared beforehand. He not only knew the business; he knew also what was likely to be said for and against any proposition, and he knew pretty well who would be saying what. If he foresaw trouble, he would arrange for quiet consultations beforehand. Thus, business came to the faculty well considered. The issues were not cut and dried; but there were few surprises for the Dean. Even the most difficult matters were usually settled quickly and amicably; and if it emerged that this would not happen he was ever ready and keen to take the matter away for further study—which meant that he put in even more hard work and consulted still more of those whose interest was involved. The meetings went quickly and smoothly not because he avoided discussion, but because he provided the work which kept the discussion informed and made the opportunities for all whose concern was serious to give their minds to the problem in advance. Each year, the faculty required less than ten seconds to re-elect him dean after he and the clerk had withdrawn; this was only one of the measures of the confidence and gratitude of his colleagues.

"He was ever careful of the best interests of the students—the mediocre and the disappointing as well as the industrious and brilliant. Many of the students from overseas owed him a particular debt, and he was much gratified when one Nigerian named his villa after him and sent him a photograph showing the name clearly marked in big letters on the gateposts. It was a well-conceived gesture, for Wishart was always keen to see people get what they desired if he thought that they had a good or even a fairly good claim. Unduly high rates of failure in the examinations always disturbed him, and the last explanation of these that he would ever accept was that the students were a poor lot. Even if all his colleagues did not accept some of his alternative propositions, they admired and respected his faith in the students and his advocacy of their case.

"He directed postgraduate education in Glasgow with great care and thought. He never allowed schemes to become grandiose or to flourish merely because they looked wonderful on paper. He was ever aware of the need to keep education medical and realistic as well as to have it scientific and polished. He admired high standards but he was critical of claims that overreached realities. Teachers who had something real to offer could always count on his welcome and his protection, especially if their position might have made them liable to be overlooked.

"On the Regional Hospital Board he gave hours of devoted service, taking scrupulous care over the anxious matter of all appointments, including the most junior. Wishart was anxious to support the right cause and to do it for the right reason. His fairmindedness made him an ally worth having in any debate or administrative battle. Every now and then he would telephone and say: 'Listen now—don't explode—just listen and tell me how you think this one would go . . .' 'This one' often proved to be a bureaucratic proposal that would be bound to rouse righteous professional indignation. 'All right,' Wishart would say, 'keep calm; don't worry; I think I know now what to tell them. That's all I wanted.' And so many potential wrangles were happily averted by his quiet watchfulness over professional interests and by the good name he made among administrators for his fairminded advice.

"His colleagues know that they will miss his service and his leadership; they have still to discover how great their loss is."

This later absorption in administration tended to divert attention from the merit of his earlier research. In assessing this work R. C. G. writes:

"A generation or so ago medicine was still very much an empirical art. Many medical men viewed askance the disturbing intrusion of chemistry and of physics into the preclinical discipline of physiology with its lusty offspring biochemistry. Wishart, on the other hand, was instinctively at home in the physical sciences—in chemistry, in physics, and in mathematics. It was very much his pleasure to apply physical techniques to the solution of biological problems. His studies with Thunberg in Lund gave him a continuing interest in biological oxidations and reductions and in the conditions

governing enzyme action. He also did some work on the metabolic products of muscular activity: he designed a glass electrode for measurements of pH.

"Perhaps the biophysical approach appealed rather more than the biochemical approach. In the '20s the impact of electronics on biology was just developing; everyone built a wireless receiving set. But Wishart turned this new hobby to good account in the laboratory; with an electronic oscillometer he made most valuable measurements of the blood-pressure in different parts of the human body. Quite a different style of gadget, but still showing the flair for the physical approach, was a pursuit meter, useful both in physiology and in psychology, and well in advance of contemporary design.

"However, indirect calorimetry was Wishart's real love. There was no longer any doubt about the validity of the technique, but a whole host of biological problems clamoured for attention. The actual amount of the energy expended by human beings in different tasks under various conditions offered a wellnigh inexhaustible reservoir of topics for research. In the laboratory he helped to design and build a walking platform and a bicycle and other types of ergometer. The mechanical efficiency of the human muscular machine was a somewhat more academic problem, and the validity and usefulness of the conception of a basal metabolic rate was, and still is, both an academic and practical issue.

"All Wishart's scientific work had an elegance born of meticulous care and scrupulous precision. To this was added a fastidious dislike of loose assumptions, uncritical argument, and anything which smacked of self-advertisement. The work he did for his university and for the medical services was at the expense of scientific work of the highest calibre: one can well regret the scientist lost in the administrator."

Professor Wishart died on July 18. He leaves a widow, who was one of his colleagues in his department, and two daughters one of whom is a doctor.

KEITH CHITTY

M.B. Cantab., F.R.C.S.

Mr. Chitty, who was appointed consultant surgeon to the Mid-Worcestershire group of hospitals last December, died at his home in Chaddesley Corbett, near Kidderminster, on July 9, at the age of 38.

He was the son of Mr. Hubert Chitty, consulting surgeon to the Bristol Royal Infirmary, who survives him. He was educated at Clifton College, and gained an exhibition at Peterhouse, Cambridge, in 1938. From there he went to University College Hospital, where he won the Erichsen prize in practical surgery. He qualified in 1943, and soon afterwards joined the R.A.M.C. He landed in Normandy on D+1 and was medical officer to the engineers who constructed Mulberry Harbour. He served throughout the campaign and later went to India. After his return in 1947, he spent five years as a registrar at U.C.H., serving successively under Prof. R. S. Pilcher, Mr. Cecil Flemming, and Mr. H. R. I. Wolfe. In 1952 he went to the United Bristol Hospitals, and he held the post of senior registrar to the genitourinary department until 1955, when he became senior surgical registrar at the Bristol Royal Infirmary and the Children's Hospital.

W. M. C. writes:

Keith had served a long and arduous apprenticeship in making himself an accurate and efficient surgeon. He never pushed himself forward, but he was beloved by us all for his forthright and diligent approach to his work, and his unassuming competence made him the best of colleagues. He never blamed anybody else if things went wrong, and no night was too long or operating-list too heavy for his enthusiastic willingness to give everything he had got to serve his patients. His colleagues at Kidderminster quickly accepted him as an efficient and reliable surgeon, and he was welcomed there both professionally and socially.

Mr. Chitty leaves a widow.

Notes and News

ASME

THE first conference of the Association for the Study of Medical Education[1] will be held at the Royal College of Physicians of London, Pall Mall East, S.W.1, on Thursday and Friday, Sept. 25 and 26. The theme chosen for the meeting is Experiment in Medical Education.

Prof. Robert Platt, P.R.C.P., will take the chair at the opening session when Sir Russell Brain will give an inaugural address. Other speakers will include Dr. G. P. Berry (Harvard University), Sir George Pickering, Dr. Nicholas Malleson, Prof. G. M. Bull, Dr. J. N. Morris, Prof. T. Hale Ham (Western Reserve University), and Prof. B. Rexed (Uppsala University).

The conference is open to members of the association and others, and applications should be sent to Dr. John Ellis, the hon. secretary, at the college. Further particulars will be found in our advertisement columns for July 19 (p. 38).

BRUCELLOSIS

THE third report of the F.A.O./W.H.O. Expert Committee on Brucellosis,[2] drawn up at a meeting in Lima, Peru, in October, 1957, witnesses to the continuing great importance of brucella infection of animals and man in many countries of both hemispheres; but it also records important advances in the prevention and control of such infections, particularly in regard to bovine brucellosis (contagious abortion) in the United Kingdom, the U.S.A., Canada, the Netherlands, Scandinavia, and a number of other countries.

In some of these the bovine disease has been eradicated, or almost eradicated, by means of vaccination with an attenuated live vaccine (S19) followed eventually by slaughter. It has been estimated that in the U.S.A. losses from bovine brucellosis have been reduced from $100 million in 1947 to $40 million in 1957. The disease in man has also decreased, though not always at the same rate: in the United Kingdom the lag, so far as can be ascertained, seems to be particularly great.

With regard to the transmission of infection from animals to man two aspects are specially considered in this report—first, infection through fresh goat's-milk cheese, which is the chief infecting agent in some Central and South American countries and elsewhere; and secondly the importance of previously unsuspected animals, especially the hare, as agents of spread.

The committee lay down useful criteria for judging the efficacy of any therapy for undulant fever—criteria which are particularly important in a disease which before the introduction of antibiotics often terminated suddenly and spontaneously, and which under treatment by antibiotics often seems to behave similarly but yet relapses. The report sounds the salutary warning: "All forms of antibiotic therapy and chemotherapy currently in use are merely suppressive of the infection. . . . The indiscriminate and uncritical administration of antibiotics for brucellosis offers certain hazards". Certain forms of chemotherapy (streptomycin or dihydrostreptomycin with sulphonamides, or the tetracyclines alone) are recommended. The use of corticosteroids for tiding over the toxic phase is mentioned, but extreme caution is urged in the use of these compounds.

In Russia an attenuated live vaccine (S19) has been used for the immunisation of human beings, but the committee regards such a procedure as still experimental. Of desensitisation with various antigens the committee remarks that "adequate desensitisation is difficult to accomplish and is usually transitory". But in many long-continuing cases chemotherapy is either ineffective or cannot be tolerated by the patient who has developed a high sensitivity to brucella toxins, and in such cases desensitisation is the only therapy available; and in the hands of some workers this has effectively banished the symptoms until the body's defences have restored a "com-

1. See *Lancet*, June 14, 1958, p. 1261.
2. Joint F.A.O./W.H.O. Expert Committee on Brucellosis: third report. *Tech. Rep. Wld Hlth Org.* 1958, no. 148. Pp. 51. 3*s.* 6*d.* Obtainable from H.M. Stationery Office, P.O. box 569, London, S.E.1.

fortable symbiosis". On the animal side experiments on a large scale with the three vaccines already evolved for protection against caprine brucellosis are urgently recommended.

Finally in dealing with the interpretation and standardisation of diagnostic tests, the committee emphasises the importance of stating the results of seroagglutination tests in international units per millilitre, in order to facilitate comparison of data given by different methods.

HELP FOR MOTHERS

FOR the past ten years a few pioneers have offered training and encouragement, instead of punishment and censure, to mothers who are not making a success of running their homes. One of their early ventures, Spofforth Hall [1] near Harrogate, which was run by the Elizabeth Fry Memorial Trust of the Society of Friends, had to close about a year ago when its lease ran out; but the Trust is now opening its successor, which will be known as the Elizabeth Fry Home, at West Bank, Acomb, York. The new premises have some advantages over the old. Spofforth Hall was a lovely house; West Bank is in York and has smaller rooms and will seem less strange to the families who come for training. The Trust will continue to take mothers accompanied by their younger children. It hopes to accept those who may have been before the courts on a charge of child neglect as well as those sent by local health authorities who fear the breakup of a family. As the home is within the city, the officers of the welfare and health departments will be able to take a greater part in the work than was possible at Spofforth Hall.

University of Oxford

On July 12 the degree of B.M. was conferred on the following:

Neville Rosen, M. W. Price, E. H. Stibbe, J. R. Harper, W. P. Metcalfe, David Negus, Alan Percival, J. G. Wood, D. W. C. Dove, J. C. Anderson, James Freeman, P. D. Oldreive, R. P. Golding, W. G. Everett, J. C. Probert, M. J. Brown, Janet A. Bone, Julia D. Dawkins, Isabel C. A. Greig, *M. W. Moncrieff, *John Dupré, *N. H. M. McKinney, *M. E. Woolrych, *S. D. Weisbaum, *Mignon S. Marston.

* In absentia

University of St. Andrews

The university court, acting with the Eastern Regional Hospital Board, has appointed Dr. D. M. Green, senior lecturer in bacteriology at Queen's College, Dundee. With the post is associated an honorary appointment from the regional board as assistant bacteriologist with the status of consultant. Dr. Green will take up his duties on Aug. 1.

Royal College of Obstetricians and Gynæcologists

On July 26 a meeting of the council was held with Prof. A. M. Claye, the president, in the chair. The following officers were re-elected:

President, A. M. Claye; hon. treasurer, A. C. H. Bell; hon. secretary, Ian Jackson; hon. librarian, A. J. McNair; hon. curator of the museum, Alan Brews; hon. treasurer, Australian regional council, J. N. Chesterman; hon. treasurer, Canadian regional council, G. A. Simpson; hon. treasurer, New Zealand regional council, A. M. Rutherford; hon. treasurer, South African regional council, F. N. Charnock.

The following officers were elected:

Vice-presidents, G. F. Gibberd, S. W. Maslen-Jones.

The following were elected to the membership:

Prabhavathy Aiman, Prasannatissa Harischandra Amarasinghe, D. T. C. Barber, C. T. H. Barrett, W. P. Bonnici, John Breeze, J. M. Brudenell, D. Pui-Chee Chan, H. J. H. Claassens, C. J. T. Craig, Dilip Ranjan Das, R. M. Davie, R. F. Drake, G. R. Duncan, G. H. Ellidge, W. H. Fernando, L. H. Fienberg, J. MacD. G. Harley, Denys Heginbotham, J. B. Hemsley, Alice Hsiang-Lien Hsu, P. J. Huntingford, Sylvia R. Ingold, Katherine I. Jack, R. D. Johnstone, E. W. P. Jones, A. J. Keane, A. C. Keast, D. M. D. King, Sybil V. Kinley, Daphne R. Lowe, John McGlone, Sheila Malhotra, Gouri Sankar Mandal, D. T. Mathews, Charu Chandra Mitra, Diana Montgomery, W. P. L. Morrison, A. D. Muirhead, Selvino Muscat, Sapugahawattege Henry Pijadasa Nanayakkara, Isabella R. Napier, Hannah J. Pash, J. H. Peters, D. W. Pfanner, Carmen M. Rant, D. M. Reader, W. J. C. Rebello, John St. George, Ajit Kumar Sarkar, P. C. Stitchbury, Jean O. Struthers, W. M. E. Tweed, Radha Naravan Udipi, Thiagarajah Visvanathan, A. W. G. Weir, Dorothy J. Whitney, W. G. Wicks, Balasubramaniam Yoganathan.

British Medical Association

Dr. Walter Hedgcock has been appointed deputy secretary of the Association, and Dr. D. L. Gullick and Dr. J. D. J. Havard assistant secretaries.

1. See *Lancet*, 1953, ii, 460.

Royal College of Physicians of Edinburgh

At a meeting of the college held on July 22, with Dr. A. Rae Gilchrist, the president, in the chair, the following were elected to the membership:

T. E. Anderson, T. N. Macgregor, Wilfred Sircus, Pow Meng Yap, M. F. H. Kelleher, Krishna Kumar Gupta, Amin Salim Jureidini, Rathna Vasant Kumar Alwa, Mohammed Abdul Ghani, Mahmoud Mohamed Hassan, J. M. Hughes, K. J. Cullen, E. A. Kauffmann, Jyotirup Chatterjee, Loku Banda Tennekoon Jayasundera, J. G. Wijeyesekera, Rajeshwari Prasad Sharma, Nirmala Haridas Gopaldas, J. D. E. Knox, Arumakuttige Parakrama Jayasena Weerasekera, Raj Kishore Parida, Jacob Schneider, B. W. Petty, Akiwusi Abiola Akiwumi, Evelyn Hanam, D. A. Seaton, R. D. Catterall, J. H. A. Dwek, Ram Nath Gupta, David Zentkowsky, Hau Cheong Kwaan, Maung Hla Myint, Thanuvelil Scaria Koshy, Asif Ali Hameedi, Dharamvir Narula, Rusi Jehangir Buhariwalla, Chin Thuan Lee, Werner Heinrich Schutt, Harry Stark, Batukrai Gulabrai Gandhi, Yong Kiat Lee, Kranti Prasad Jain.

International Association of Gerontology

The first meeting of the European clinical section of this association is to be held at Sunderland General Hospital, from Oct. 1 to 4. Further information can be had from Dr. E. Woodford-Williams, at the hospital, Chester Road, Sunderland.

Institute of Laryngology and Otology, London

On Friday, Aug. 8, at 5.30 P.M. at the institute, 330, Gray's Inn Road, W.C.1, Dr. Ben H. Senturia, of St. Louis, will speak on diseases of the external ear.

Effects of Pollution on Living Matter

The Institute of Biology is holding a symposium on this subject on Sept. 25 and 26, at the Royal Geographical Society, Kensington Gore, London, S.W.7. Further particulars may be had from the secretary of the institute, 41, Queen's Gate, S.W.7.

Conference on General Practice

The *Medical World* is holding a conference on general practice in the Victoria Halls, Bloomsbury Square, London, W.C.1, on Sunday, Oct. 26. Tickets (10*s*. 6*d*.) may be had from the conference organiser, 56, Russell Square, W.C.1.

The Medical Insurance Agency

The 30th annual meeting was held at B.M.A. House, London, on July 24. The report of the committee of management disclosed new records of business done in all branches: new high levels of assurances have been negotiated and higher profits have been allocated to medical charities. The report ended with a claim that the agency's work is of great service to the profession, that more and more doctors recognise that this is so, and that in reputation and esteem it has never before stood so high.

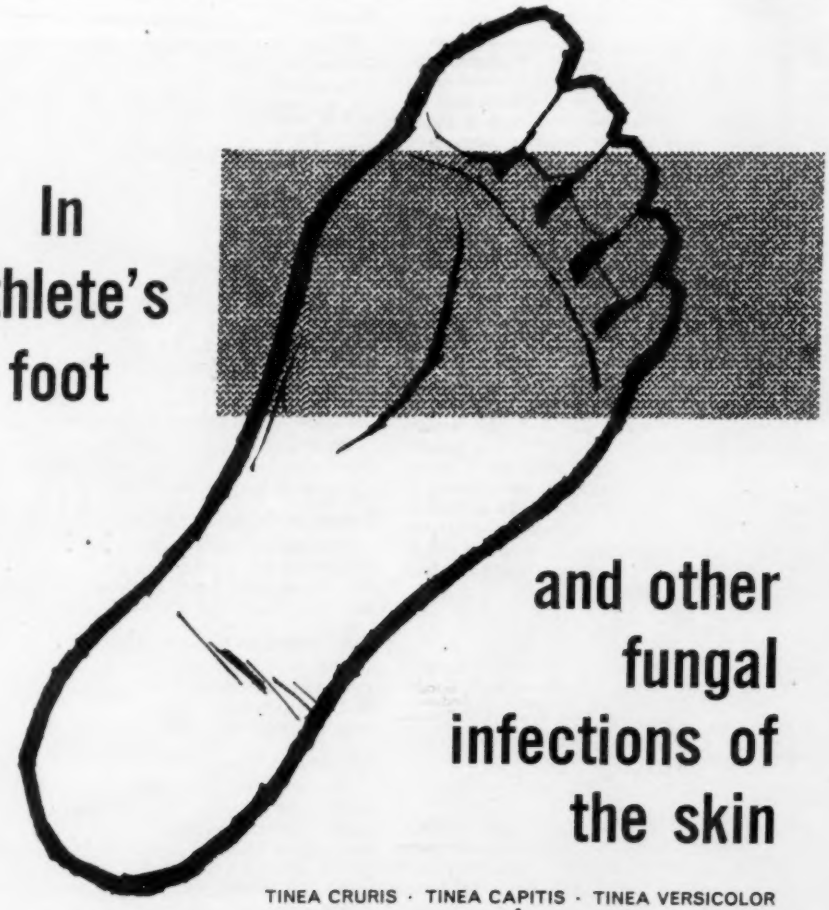
Sir Russell Brain and Sir Cecil Wakeley were elected to the committee. Retiring members re-elected were Dr. James Fenton, Sir Archibald Gray, Mr. A. M. A. Moore, Mr. Ronald Raven, Dr. Oliver Scott, Mr. Ben Thomas, and Sir Henry Tidy. Dr. Fenton was re-elected chairman, and Dr. Henry Robinson hon. secretary. The report contained an emphatic tribute to the work of the general manager, Mr. A. N. Dixon, and his staff.

St. Clement's Hospital, Bow

King Edward's Hospital Fund for London are to make a grant of £50,000 to help the North East Metropolitan Regional Board in their plans for developing this hospital as a modern psychiatric hospital.

The hospital already has an observation ward and a small unit for cases of psychoneurosis, and as the board think that in the future the hospital will no longer be needed for the general hospital needs of the area, they have decided to extend the psychiatric work with the ultimate object of establishing a modern neuropsychiatric centre for East London, which will provide full facilities for the investigation and treatment of all types of acute mental illness, as well as for teaching and research. As a first step it is proposed to refurbish a three-storey block at the hospital which is at present derelict, and to set up a day hospital for old people in the early stages of mental deterioration. This unit would be combined with a domiciliary service in cooperation with the local authority. Apart from the day hospital, it is intended to provide an inpatient unit for severely disturbed young patients and to extend the occupational therapy and outpatient departments. The first stage of the plan will cost about £59,000, and the gift from the King's Fund will enable the board to approach the Minister of Health for approval to embark on this project.

In athlete's foot



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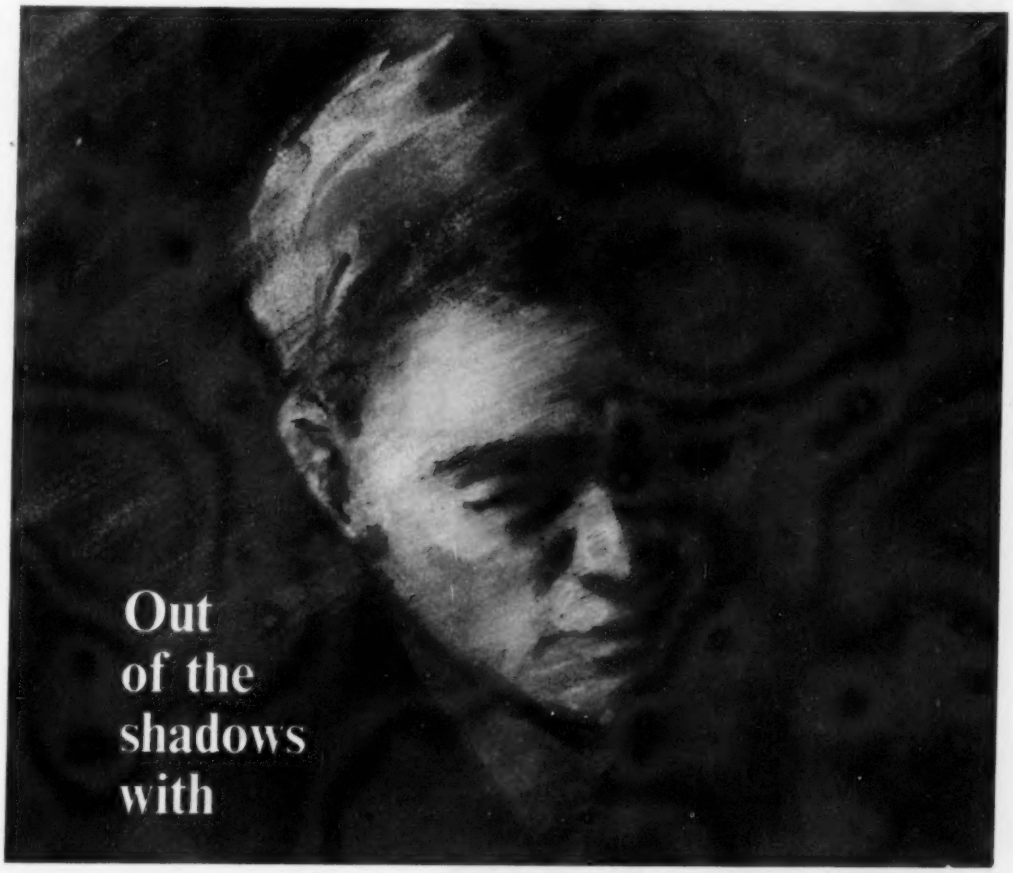

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(1) 'Topical Aspects of Poliomyelitis'; 'Journal of the Royal Society of Health' Dec. 1956.
(2) World Health Organisation Technical Report Series, No. 81, 'Expert Committee on Poliomyelitis'.
(3) Domestos Technical Report D.R. 82A.

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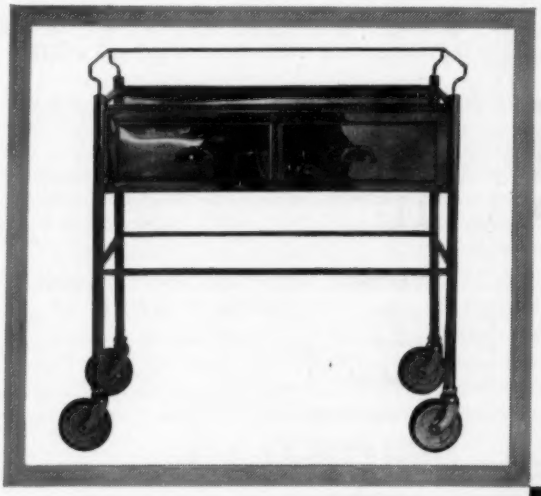

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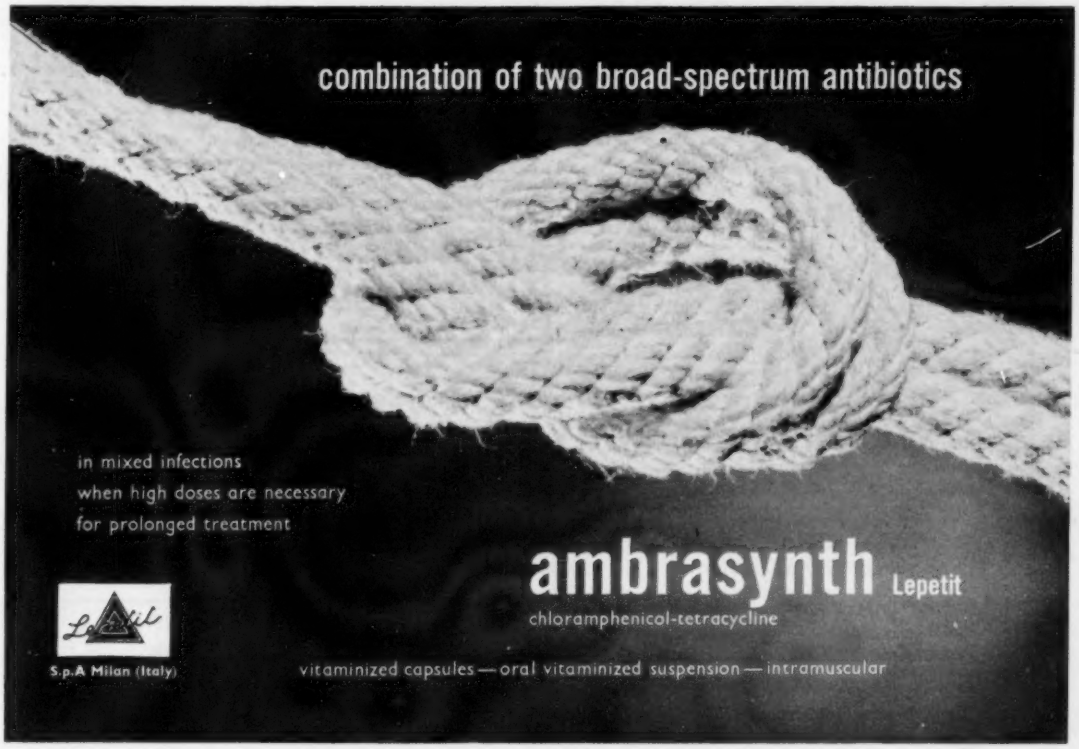

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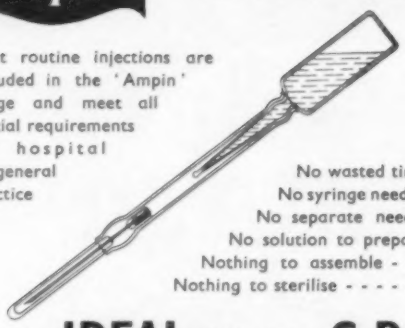

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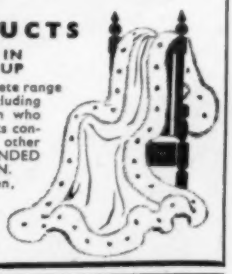

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Royal Free, W.C.1. Sr. H.O. 31
South London Hosp. for Women & Children, S.W.4. P.-t. Sr. H.O. .. 31
Wanstead, E.11. Sr. H.O. 32
Aylesbury. Royal Bucks. Sr. H.O. .. 32
Brighton. Royal Sussex County. H.O. 33
Bromley, Kent. Sr. H.O. 33
Canterbury. Kent & Canterbury Hosp. Sr. H.O. 33
Colchester Group H.M.C. Temp. Reg. 34
Edgware Gen. Sr. H.O. 34
Grimsby Gen. Sr. H.O. 35
Harrogate & Dist. Gen. Jr. H.M.O. 35
Hastings. Royal East Sussex. Sr. H.O.'s 35
Hillingdon, Middx. Jr. H.M.O. .. 35
Ipswich & East Suffolk. Sr. H.O. .. 36
Kettering & Dist. Gen. Sr. H.O. .. 36
Liverpool United Hosps. Reg. .. 36
Mexborough. Montagu. Locum Sr. H.O. 37
Nottingham Gen. Sr. H.O. 37
Swindon & Dist. H.M.C. Sr. H.O.'s .. 40
Warrington Infy. Jr. H.M.O. 40

CHEST AND TUBERCULOSIS

Brompton, S.W.3. H.O.'s 30
London Chest, E.2. H.O.'s 30
Plaistow, E.13. H.O. 31
Bristol. Ham Green. Jr. H.M.O. .. 32
Chelmsford. Broomfield. Locum Sr. Reg. 34
Colchester Group H.M.C. Locum Reg. 34
Grimsby. Springfield. Reg. 35
Liverpool R.H.B. P.-t. Cons. .. 29
Northampton. Creaton. Sr. H.O. .. 37
North West Met. R.H.B. Sr. H.M.O. 29
Salford. Ladywell. Jr. H.M.O. .. 38
Wakefield. Pinderfields Gen. Sr. H.O. 40
Welsh R.H.B. Reg. 40
Wigan. Wrightington. Sr. H.O. .. 40

DERMATOLOGY

Birmingham. Skin. Sr. H.O. or H.O. 32
Sheffield United Hosps. Sr. H.O. .. 39

EAR, NOSE, AND THROAT

Brighton & Lewes H.M.C. Group Hosps. Sr. H.O. 33
Chertsey, St. Peter's, & Guildford, Royal Surrey County. Locum Reg. 34
Edgware Gen. Sr. H.O. 35
Glasgow. Stobhill Gen. H.O.'s .. 35
Liverpool United Hosps. Sr. H.O. .. 36
Wolverhampton. Royal. Pre-reg. H.O. 40

GERIATRICS

Whipps Cross, E.11. H.O. 32
Glasgow. Stobhill Gen. H.O.'s .. 35
Hornchurch. St. George's. Jr. H.M.O. 35

INFECTIOUS DISEASES

Eastern (Fevers), E.9. H.O. 30
Cardiff Isolation. Sr. H.O. 33
Ipswich. St. Helen's. H.O. 36

MEDICINE

Bethnal Green, E.2. Pre-reg. H.O. .. 30
Charing Cross, W.C.2. Reg. 30
Connaught, E.17. H.O. 30
German, E.8. H.O. 30
Hammersmith Hosp. & P.G. Med. School, W.12. Sr. Reg. 30
South East Met. R.H.B. Reg. .. 31
St. Charles', W.10. Reg. 31
St. Leonards, N.1. H.O. 31
St. Mary's Hosp. for Women & Child., E.13. Sr. H.O. 31
St. Stephen's, S.W.10. Regs. 31
Alton Gen. Sr. H.O. 32
Barnstaple. North Devon Infy. Pre-reg. H.O. 32
Beverley. Westwood. H.O. 32
Bolton & Dist. H.M.C. Sr. H.O.'s .. 32
Brighton. Royal Sussex County. Pre-reg. H.O.'s 33
Bristol. Cossham & Frenchay H.M.C. Sr. H.O. 33
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 33
Bromsgrove Gen. Sr. H.O. 33
Burnley Gen. H.O. 33
Chatham. All Saints'. H.O. 33
Colchester Group H.M.C. Locum Reg. 34
Derby. City. Pre-reg. H.O. or Sr. H.O. 34
Dewsbury. Gen. Pre-reg. H.O. .. 34
Driffield. East Riding Gen. H.O. .. 34
Dudley, Stourbridge & Dist. Pre-reg. H.O. 34
Edgware Gen. H.O. 34

(Continued overleaf)

Enfield. War Mem. Sr. H.O. .. 34
Gainsborough. John Coupland. Locum Jr. H.M.O. 35
Great Yarmouth & Gorleston Gen. H.O. or Sr. H.O. 35
Grimsby Gen. Pre-reg. H.O. 35
Hertford County. H.O. 35
High Wycombe. War Mem. Sr. H.O. 35
Huddersfield Royal Infy. Pre-reg. H.O. 35
Huntingdon County. H.O. 36
Kingston, Surrey. Pre-reg. H.O. .. 36
Leamington Spa. Warneford Gen. Locum H.O. 36
Leeds R.H.B. Locum Regs. 36
Leeds R.H.B. Reg. 36
Lincoln County. H.O. 36
Manchester R.H.B. Reg. 36
Mitcham Junction. Wandle Valley. Sr. H.O. 37
Portsmouth Group H.M.C. Sr. H.O. 38
Reading. Royal Berkshire. H.O.'s .. 38
Rochdale & Dist. H.M.C. H.O. .. 38
Romford. Oldchurch. H.O.'s .. 38
Romford, Rush Green. Locum Reg. 38
South Somerset Clinical Area. Cons. 30
Stockport. Stepping Hill. Pre-reg. H.O.'s 39
Stoke-on-Trent. City Gen. Pre-reg. H.O. 39
Stoke-on-Trent. North Staffs. Royal Infy. Pre-reg. H.O. 39
Stoke-on-Trent. North Staffs Royal Infy. Pre-reg. H.O. 39
Walsall H.M.C. Locum H.O. .. 40
Wolverhampton. New Cross. Pre-reg. H.O. 40
Wrexham. Maelor Gen. & War Mem. Hosps. H.O.'s 41
Tasmania. Launceston Gen. Reg. .. 41

NEUROSURGERY

Sheffield United Hosps. Reg. & Sr. H.O. 39
South East Met. R.H.B. Reg. .. 39

OBSTETRICS AND GYNÆCOLOGY

Bethnal Green, E.2. H.O. 30
Guy's, S.E.1. Asst. to Director .. 29
Birmingham United Hosps. H.O. 32
Bristol. Southmead Gen. Hosp. Group M.C. Sr. H.O. 33
Bushey Maternity. H.O. 33
Canterbury. Kent & Canterbury. H.O. 33
Chatham. All Saints'. H.O. .. 34
Dorking Gen. Sr. H.O. 34
Hexham Gen. H.O. 35
Manchester. Crumpsall. Reg. .. 36
Manchester Northern. Sr. H.O. .. 37
Manchester United Hosps. Sr. H.O.'s 37
Nottingham City. Reg. 37
Scotland. South-Eastern R.H.B. Reg. 39
Shrewsbury. Cross Houses. Pre-reg. H.O. 39
Stoke-on-Trent. City Gen. Pre-reg. H.O. 40
Welsh R.H.B. Locum Cons. 30
Wrexham. Trevalyn Manor Maty. H.O. 41
York. Maternity & Fulford Hosps. Sr. H.O. 41

OPHTHALMOLOGY

Brighton. Sussex Eye. Sr. H.O. & H.O. 33
Cardiff United Hosps. & Welsh R.H.B. P.-t. Cons. 29
Manchester United Hosps. Sr. H.O. .. 37
Newcastle H.M.C. Sr. H.O. 37

ORTHOPÆDICS

St. Charles', W.10. Reg. 31
Aberdeen Gen. Hosps. B.o.M. Sr. H.O. 32
Batley. Gen. Sr. H.O. 32
Brighton Gen. Sr. H.O. & Pre-reg. H.O. 33
Burnley & Dist. H.M.C. Sr. H.O. .. 33
Burton-on-Trent Gen. Pre-reg. H.O. 33
Cardiff. Prince of Wales Orthopædic. Sr. H.O. 33
Cuckfield, Sussex. H.O. 34
Derby. Derbyshire Royal Infy. Sr. H.O. 34
Galashiels. Peel. Sr. H.O. & H.O. .. 35
Leeds R.H.B. Locum Regs. 36
Leeds. Woodlands Orthopædic. Sr. H.O. 36
Newcastle Gen. Sr. H.O. 37
Norwich. Norfolk & Norwich. H.O. 37
Orpington, Kent. Pre-reg. H.O. .. 37
Portsmouth Group H.M.C. Sr. H.O. & Pre-reg. H.O. 38
Preston Royal Infy. Sr. H.O. .. 38
Reading. Battle. H.O. 38
Romford. Oldchurch. H.O. 38
Swansea. Sr. H.O. 40
Wakefield. Pinderfields Gen. Sr. H.O. 40
Wigan. Wrightington. Sr. H.O. .. 40
Worcester Royal Infy. H.O. 40

PÆDIATRICS

North Middlesex, N.18. Sr. H.O. .. 31
North West Met. R.H.B. P.-t. Cons. 29
Queen Elizabeth Hosp. for Child. H.O. 31
St. Thomas's, S.E.1, & South West Met. R.H.B. Sr. Reg. 31
Chatham. All Saints'. H.O. .. 33
Durham. Dryburn. Sr. H.O. 34
Leeds R.H.B. Reg. 36
Newcastle R.H.B. & United Hosps. Regs. 37
Newcastle United Hosps. Sr. H.O. .. 37
Reading. Royal Berkshire. H.O. .. 38
Rhyl. Royal Alexandra. H.O. .. 38
Salford. Hope. H.O. 39
Southend-on-Sea. Gen. H.O. .. 39
Wrexham. Maelor Gen. H.O. 41

PATHOLOGY

London Clinic. Director 29
Royal Free, W.C.1. Sr. H.O. 31
Brighton. Royal Sussex County. Sr. H.O. 33
Manchester. Booth Hall Children's. Sr. H.O. 36
Romford. Oldchurch. Sr. H.O. .. 38
Sheffield R.H.B. Cons. 29
Woking & Chertsey Group Lab. Sr. H.O. 40
St. John's, Newfoundland, Canada. Gen. Interne 41
Tasmania. Launceston Gen. Reg. .. 41

PSYCHIATRY

St. Clement's, E.3. Sr. H.O. .. 31
Arlesey, Beds. Three Counties. Sr. H.O. 32
Birmingham R.H.B. Sr. Reg. .. 32
Bury & Rochdale Hosp. Groups. Reg. 33
Dorchester. Herrison. Jr. H.M.O. .. 34
Glasgow. Hawkhead. Jr. H.M.O. .. 35
Hailsham, Sussex. Hellingly. Jr. H.M.O. 35
Leeds R.H.B. Locum Regs. 36
Scotland. South-Eastern R.H.B. Regs. 39
Scotland. Western R.H.B. Reg. .. 39
Sheffield United Hosps. Sr. H.O. .. 39
South East Met. R.H.B. Cons 29/30
St. Albans. Napsbury Mental. Sr. H.O. 40
Wakefield. Stanley Royd. Jr. H.M.O. or Sr. H.O. 40
Welsh R.H.B. Cons. 30
Canada & Western Nova Scotia Clinic. Asst. Psych. 30

RADIOLOGY

Birmingham R.H.B. & United Hosps. Sr. Reg. 32
Hertford Group H.M.C. P.-t. Locum 29
Leeds United Hosps. Reg. 36
Medway & Gravesend H.M.C. Locum P.-t. Cons. 29
Welsh R.H.B. Cons. 30
Tasmania. Launceston Gen. Reg. .. 41

RADIOTHERAPY

Marie Curie, N.W.3. H.O. 31
Edinburgh Northern Group. Sr. H.O. 34

SURGERY

Hackney, E.9. H.O. 30
Highlands Gen., N.21. Sr. H.O. .. 30
Mildmay Mission, E.2. Pre-reg. H.O. 31
Mile End, E.1. H.O. 31
National Temperance, N.W.1. Pre-reg. H.O. 31
St. Ann's Gen., N.15. H.O. 31
St. Nicholas, S.E.18. H.O. 31
Wanstead, E.11. H.O. 31
Aberystwyth. Gen. H.O. 32
Alton. Henry Gauvain. Sr. H.O. .. 32
Aylesbury. Royal Bucks & Assoc. H.M.C. H.O.'s 32
Barnstaple. North Devon Infy. Pre-reg. H.O. 32
Barry Accident & Surgical. Sr. H.O. 32
Bedford Gen. H.O. 32
Birmingham R.H.B. Reg. 32
Bishop Auckland. Gen. H.O. .. 32
Bishop's Stortford, Herts & Essex Gen. Pre-reg. H.O. 32
Blackburn & Dist. H.M.C. H.O.'s .. 32
Bromsgrove Gen. Sr. H.O. 33
Burnley & Dist. H.M.C. H.O.'s .. 33
Cardiff. Rookwood. Sr. H.O. .. 33
Castleford, Normanton & Dist. Sr. H.O. 33
Chichester. St. Richard's. Pre-reg. H.O. 33
Colchester Group H.M.C. Locum Regs. 34
Darlington Memorial. Sr. H.O. .. 34
Derby. City. Pre-reg. H.O.'s or Sr. H.O.'s 34
Derby. Derbyshire Royal Infy. Sr. H.O. 34
Dewsbury. Gen. Pre-reg. H.O. or Locum 34
Dorchester. Dorset County. Pre-reg. H.O. 34
Dorking Gen. Sr. H.O. 34
Driffield. East Riding Gen. H.O. .. 34
Dudley, Stourbridge & Dist. Pre-reg. H.O. 34
Edgware Gen. Locum H.O. 35
Enfield. Chase Farm. H.O. 34
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Glasgow. Stobhill Gen. H.O.'s .. 35
Gravesend & North Kent. Pre-reg. H.O. 35
Hastings. Royal East Sussex. Pre-reg. H.O.'s 35
Hertford County. Pre-reg. H.O. .. 35
Hexham Gen. H.O. 35
Huddersfield Royal Infy. H.O. .. 36
Hull. Victoria Hosp. for Sick Child. H.O. or Locum 36
Isleworth. West Middlesex. H.O. .. 36
Leeds R.H.B. Locum Regs. 36
Leigh (Lancs) Infy. Reg. 36
Manchester. Booth Hall Children's. Sr. H.O. & H.O. 36
Manchester R.H.B. Reg. 36
Manchester R.H.B. Reg. 36
Manchester. Royal Manchester Children's. Locum Reg. 36
Manchester. West Manchester H.M.C. Sr. H.O. 37
Newbury Dist. Locum Sr. H.O. .. 37
Newcastle Gen. H.O. 37
Norwich. Norfolk & Norwich. H.O. & Locum Reg. 37
Nottingham Children's. Sr. H.O. .. 37
Nottingham City. Sr. H.O. 37
Nottingham Gen. Sr. H.O. & Pre-reg. H.O.'s 37
Oldham & Dist. Gen. H.O.'s 37
Oldham & Dist. H.M.C. Locum Sr. H.O. 38
Oldham Royal Infy. H.O.'s 38
Oxford R.H.B. Reg. 38
Paisley. Royal Alexandra Infy. H.O.'s 38
Plymouth. South Devon & East Cornwall. Pre-reg. H.O. 38
Portsmouth Group H.M.C. Pre-reg. H.O. 38
Preston Royal Infy. H.O. 38
Richmond, Surrey. Royal. Reg. .. 38
Redhill. East Surrey. Pre-reg. H.O. 38
Rochdale & Dist. H.M.C. H.O. .. 38
Rochford Gen. Essex. Sr. H.O. .. 38
Romford. Oldchurch. H.O.'s .. 38
Romford. Victoria. Temp. Reg. .. 38
Rotherham. Reg. 38
Rugby. Hospital of St. Cross. Pre-reg. H.O. 38
Scotland. South-Eastern R.H.B. Reg. 39
Scunthorpe. War Mem. Sr. H.O. or Pre-reg. H.O. 39
Scunthorpe. War Mem. Pre-reg. H.O. or Sr. H.O. 39
Sheffield United Hosps. Reg. .. 39
Shrewsbury. Royal Salop Infy./Copthorne. H.O. 39
Shoreham-by-Sea. Southlands. H.O. 39
Slough. Upton. Locum Sr. Reg. .. 38
Southend-on-Sea. Gen. Locum Sr. Reg. 39
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Stockport. Stepping Hill. H.O. .. 39
Stoke-on-Trent. City Gen. Sr. H.O. .. 40
Stoke-on-Trent. North Staffs. Royal Infy. H.O. 39
Torquay. Torbay. H.O. 40
Walsall H.M.C. Locum H.O. 40
Watford. Pence Mem. Pre-reg. H.O. 40
Weston-super-Mare Gen. Sr. H.O. & Pre-reg. H.O. 40
Wolverhampton. New Cross. Pre-reg. H.O. 40
Wolverhampton. Royal. Pre-reg. H.O. 40
Worcester Royal Infy. H.O. 40
Worthing. H.O. 41
Wrexham. Maelor Gen. & War Mem. Pre-reg. H.O.'s 41

THORACIC SURGERY

Brompton, S.W.3. Reg. 30
London Chest, E.2. Sr. H.O. or Reg. 30
Harefield Hosp. Regional Thoracic Surg. Unit. Reg. 35
Ilkley. Middleton. Sr. H.O. 36
Sully, Glam. Sr. H.O. 40
Wakefield. Pinderfields Gen. Sr. H.O. 40
Wolverhampton. Royal. H.O. .. 40

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The next EXAMINATION for the MEMBERSHIP will commence on MONDAY, 29TH SEPTEMBER, 1958.

Prospective candidates are asked to note that entries accompanied by the certificates, testimonials and the Examination fee of 15 guineas as required by the Bye-Laws, must reach the College not later than first post on Monday, 1st September, 1958. Candidates must have been qualified for 18 months.

Candidates who propose to submit Published Work under the regulations are required to give 28 days' notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow. Completed entries for Published Work must also reach the College not later than first post on Monday, 1st September, 1958.

HAROLD BOLDERO, D.M., Registrar.

12, Pall Mall East, London, S.W.1.

ANÆSTHETICS COURSE

A 2-week COURSE OF LECTURES, DEMONSTRATIONS AND TUTORIALS for postgraduates preparing for higher diplomas in anæsthetics will be held from 13TH to 24TH OCTOBER, 1958.

Fees: Lectures and demonstrations £15 15s.

Tutorial discussion groups £10 10s.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetics, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2 (Telephone HOLborn 3474, extension 23).

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE DIPLOMA IN PUBLIC HEALTH
THE DIPLOMA IN INDUSTRIAL HEALTH

The next COURSES OF INSTRUCTION for the above Diplomas will commence on 12TH SEPTEMBER, 1958. Tuition may be taken whole-time or part-time.

Prospectuses, enrolment forms, and full details may be obtained from the Dean, 23, Queen-square, London, W.C.1 (Telephone: TERminus 4788/6206).

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

MEDICAL UNIT

Applications are invited for the post of ASSISTANT in the Medical Unit. The appointment, which is Lecturer grade, will be available from 1st October, 1958.

Salary within the range of £1150, rising by annual increments of £100 to £1750 p.a., with superannuation benefits and university allowances.

Applications, with names of 2 referees, should be sent to the Secretary of University College Hospital Medical School, University-street, London, W.C.1, not later than 14 days from the date of the appearance of this advertisement.

AUSTRALIA—UNIVERSITY OF MELBOURNE

CHAIR OF OPHTHALMOLOGY

Applications are invited for the joint position of Professor of Ophthalmology and Director of Research of the Ophthalmic Research Institute of Australia.

The salary will be £A4500 p.a., and superannuation similar to F.S.S.U. in Great Britain will be provided.

Further information and conditions of appointment may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. Applications close in Australia and London on 15th November, 1958.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE and THE ROYAL FREE HOSPITAL SCHOOL OF MEDICINE. Applications are invited for the post of LECTURER IN PREVENTIVE AND SOCIAL MEDICINE. The D.P.H. or its equivalent is essential. The appointment will be for 2 years in the first instance. Salary on the scale £1150–£100–£1750, with family allowances. Superannuation under F.S.S.U. Duties will include postgraduate teaching at the London School of Hygiene and Tropical Medicine, and undergraduate teaching at the Royal Free Hospital School of Medicine. Opportunities will be given for research. Duties will begin on 1st October, 1958, or as soon afterwards as possible.

Applications should be submitted by letter to the Dean, London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C.1, not later than 29th August, 1958.

THE UNIVERSITY OF MANCHESTER. Applications are invited for the post of SURGICAL TUTOR. Salary £1050 p.a. with membership of Children's Allowance Scheme. The Tutor will be required to give instruction in practical surgery and supervise the studies of students during their period of clinical apprenticeship. In addition the Tutor will be required to take part in the clinical and research activities of the Department of Surgery. A higher qualification in surgery will be considered an advantage.

Applications should be sent not later than 16th August to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

UNIVERSITY OF ST. ANDREWS. The University Court of the University of St. Andrews invites applications for appointment as LECTURER IN BACTERIOLOGY in Queen's College, Dundee, University of St. Andrews. Salary £900–£100–£1900 (efficiency bar £1400); placing according to qualifications and experience. F.S.S.U.; family allowance; grant towards expenses of removal. The person appointed will receive an honorary appointment from the Eastern Regional Hospital Board as Assistant Bacteriologist.

Applications (8 copies), with the names of 3 referees, to be lodged with the undersigned not later than 31st August, 1958.

PATRICK CUMMING,
Joint Clerk to the University Court.

Queen's College, Dundee. July, 1958.

Hospital Services: Senior Appointments

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of ASSISTANT to the Director of the Department of Obstetrics (half-time). The appointment will be for 1 year in the first instance, with duties from 1st October, 1958. The salary will be £975–£50–£1375.

Forms of application are obtainable from, and should be lodged with, the Dean, Guy's Hospital Medical School, London Bridge, S.E.1, not later than 12th August, 1958.

LONDON CLINIC. (164 Beds.) Applications are invited for the post of DIRECTOR of the Department of Pathology. Applicants must be registered medical practitioners with a wide experience in pathology. The successful candidate will be required to join a contributory superannuation scheme if not already a member. There will be ample security of tenure of the appointment. The total emoluments will depend on qualifications and experience, but will not be less than £4000 p.a., rising to £5750 p.a.

Applications, stating age, qualifications and details of past and present appointments, together with the names of 3 referees, should be forwarded to the Secretary, London Clinic, Devonshire-place, London, W.1.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

1. CONSULTANT PÆDIATRICIAN, 2 half-days a week, Royal Northern Hospital, Holloway, N.7 (277 Beds).

Applications before 1st September, 1958.

2. ASSISTANT CHEST PHYSICIAN, whole-time, Senior Hospital Medical Officer grade, Ashford Chest Clinic, Ashford Hospital, Middlesex. Candidates should have good general medical experience and special experience in treatment of tuberculosis and diseases of the chest.

Applications before 3rd September, 1958.

Hospital and Clinic may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

CARDIFF. THE UNITED CARDIFF HOSPITALS AND THE WELSH REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT OPHTHALMOLOGIST. Maximum part-time appointment, 5 sessions with the United Cardiff Hospitals and 4 with the Regional Hospital Board.

Detailed applications (1 copy only), giving full details of qualifications and experience, and the names of 3 referees, should be forwarded to the Secretary to the Board, United Cardiff Hospitals, Cardiff Royal Infirmary, Cardiff, within 14 days of the appearance of this advertisement.

HERTFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum RADIOLOGIST required 1st–21st [September, 1958. Part-time, up to 9 sessions per week (4 sessions Bishop's Stortford Hospitals and 5 sessions Hertford County Hospital).

Applications to Group Secretary, Hertford County Hospital, Hertford. Telephone: Hertford 2275.

LIVERPOOL REGIONAL HOSPITAL BOARD. Broadgreen Hospital, Regional Thoracic Surgery Unit. Applications are invited for the post of Part-time CONSULTANT PHYSICIAN, giving 4 notional half-days at the above unit. The successful candidate will work under the general direction of the existing Senior Consultant Physician. The duties will include medical consultative advice concerning the cases submitted for surgery, and also the assessment of both respiratory and cardiac cases admitted to the Regional Thoracic Surgery Unit. Applicants must have a higher qualification in medicine and should have considerable experience in modern techniques of cardiac and respiratory assessment.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 55, Castle-street, Liverpool, 2, to be returned not later than 23rd August, 1958.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD. Additional maximum Part-time CONSULTANT ANÆSTHETIST, Burnley and District Group of hospitals (Burnley General, Victoria, Reedyford (Nelson) Hospitals, &c.). Wide experience, higher qualifications essential; appointee to live in or near Burnley.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 19th August, 1958.

MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. Locum CONSULTANT RADIOLOGIST required week commencing 1st September, 1958, for up to 7 sessions. Salary according to grading.

Please apply to Group Secretary, 20, Star-hill, Rochester, Kent, stating days available.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT PATHOLOGIST-IN-CHARGE required 7th February, for the Lincoln and Grantham Group of hospitals.

Application forms and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd August, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time CONSULTANT PSYCHIATRIST for child-guidance work at the Crayford Child Guidance Clinic, Woodside-road, Barnehurst, Kent, which is administered by the Kent Education Committee. Previous experience in child guidance is essential and candidates should preferably possess a higher qualification and hold the Diploma in Psychological Medicine. Candidates may visit the Clinic.

Applications, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 16th August, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time CONSULTANT PSYCHIATRIST at Darenth Park, Dartford, Kent, which is used for the treatment of mental defective patients. The post will carry with it duties as Deputy Medical Superintendent, and the selected candidate will undertake outpatient clinics as required. Candidates should possess a D.P.M. and preferably a higher qualification; mental deficiency experience is essential, and candidates should have had experience also in modern psychiatric therapeutic procedures and occupational therapy. Accommodation is available and applicants may visit the Hospital. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales).

Applications, stating nationality, age, sex, qualifications, and experience, including details of present appointment and of war or national service, together with the names and addresses of 3 referees, should be sent to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 16th August, 1958.

SOUTH SOMERSET CLINICAL AREA. South Western REGIONAL HOSPITAL BOARD. Applications are invited for the appointment to the South Somerset Clinical Area of a CONSULTANT PHYSICIAN with an interest in geriatrics. The appointment may be held either on a whole-time or maximum (9 sessions) part-time basis. The successful candidate will have charge of general medical beds at the Taunton and Somerset Hospital, Taunton, and Bridgwater and District Hospital, and of geriatric beds in the area; he will also be required to visit other hospitals in the clinical area as determined by the Regional Board.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 23rd August, 1958.

WELSH REGIONAL HOSPITAL BOARD. Whole-time CONSULTANT CHILD PSYCHIATRIST. This is a new post and the successful candidate will be required to develop Child Guidance Services in the Glamorgan area; the headquarters of the service will be at Glanrhyd House, Bridgend. Candidates should have had appropriate training and a wide experience in child psychiatry.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Consultant RADIOLOGIST, Merthyr and Aberdare Hospital Management Committee. Based at Merthyr General Hospital, with visits to other hospitals in the Group. Successful candidate will be required to live within the area. Optional whole-time maximum part-time appointment.

Applications (12 copies) to Senior Administrative Medical Officer, Welsh Regional Hospital Board, Temple of Peace, Cathays Park, Cardiff, within 21 days.

WELSH REGIONAL HOSPITAL BOARD. Locum Tenens CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST required. Mid Wales Area, 4 weeks commencing 11th August, 1958.

Applications, naming 2 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff.

CANADA. UNIVERSITY OF ALBERTA HOSPITAL, EDMONTON, ALBERTA, CANADA. Applications are invited for the position of ASSISTANT DIRECTOR of the Department of Clinical Laboratory Services. The duties will be concerned with the future development of the biochemistry laboratory service in the Hospital, consulting and advising on clinical problems and research projects involving biochemistry and teaching. A teaching appointment in the University of Alberta Medical School, while not automatic with this appointment, is customary. There will be ample opportunity to carry on individual research. The qualifications required are a degree in medicine and special training and experience in biochemistry. Preference will be given to those holding the M.R.C.P. or F.R.C.P., or a doctorate degree in biochemistry. Male, age 30–40, preferred but not essential. Salary $10,000–$12,000 p.a. Further details may be obtained from Professor E. J. King, Postgraduate Medical School, Ducane-road, W.12, London, England.

Interested parties should apply to the Medical Superintendent, University of Alberta Hospital, giving full details and the names of 2 referees.

CANADA. WESTERN NOVA SCOTIA CLINIC. Applications are invited for the post of ASSISTANT PSYCHIATRIST at a Government-supported rural clinic in Nova Scotia. The appointment is for 1 year in the first instance, but may be extended by mutual agreement on completion of this period. Interest in community and preventive psychiatry is essential and preference will be given to candidates possessing the D.P.M. Salary $8700 p.a.

Further particulars from the Director, Western Nova Scotia Clinic, P.O. Box 249, Digby, Nova Scotia, Canada.

Hospital Services: Junior Appointments

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. HOUSE SURGEON, gynæcology and obstetrics, pre-registration or third post, immediate vacancy.

Apply, stating experience, with copies of 2 testimonials, to Hospital Secretary.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, E.2. HOUSE PHYSICIAN, pre-registration post vacant 14th August, 1958.

Apply, stating experience, with copies of 2 testimonials, to Hospital Secretary.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Applications for the 6-month resident appointment, now vacant, of Registered HOUSE PHYSICIAN should be sent to Group Secretary, Hackney Hospital, E.9, by 11th August, quoting GH/HP.

BROMPTON HOSPITAL, S.W.3. Applications invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st October, 1958. Duties include work in outpatient department and wards. Salary at the rate of £577 10s. p.a.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 9th August, 1958, to KENNETH A. F. MILES, House Governor.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of SURGICAL REGISTRAR (whole-time). The appointment is for 1 year from 22nd September, 1958, with eligibility for reappointment. Candidates must hold the diploma of F.R.C.S.

Applications, stating age, qualifications with dates, nationality and appointments held, together with copies of testimonials, by 9th August, 1958, to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, London, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR required, 1 year in first instance, for Casualty Department, with secondary work in Orthopædic and Traumatic Unit. Resident when on duty. Duties include teaching, hand and outpatient clinics, and occasional visiting of convalescent hospital. Post vacant November. Hospital may be visited by direct appointment.

Application forms from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Park Royal, London, N.W.10, by 18th August, 1958.

CHARING CROSS HOSPITAL, W.C.2. Full-time Medical REGISTRAR (non-resident). Tenable from 1st October, 1958, for 1 year in the first instance, with eligibility for renewal.

Applications, on forms obtainable from the undersigned, to be returned by 18th August, 1958.

FRANK HART, Secretary to the Board.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) HOUSE PHYSICIAN required for a period of 6 months. Post vacant 21st August, 1958.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Locum RESIDENT ANÆSTHETIST (Senior House Officer) required from 18th August to 1st September.

Apply Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

CONNAUGHT HOSPITAL, Walthamstow, E.17. Locum CASUALTY OFFICER (Senior House Officer) required from 18th August to 8th September.

Apply Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

EASTERN HOSPITAL (Fevers), London, E.9. Registered HOUSE PHYSICIAN. Duties may include some work in Chest Unit. Facilities for postgraduate study.

Apply Group Secretary, Hackney Hospital, E.9, quoting EH/HO.

HACKNEY HOSPITAL, London, E.9. (857 Beds.) Applications from registered practitioners for appointment to the 6-month resident post of HOUSE SURGEON, with duties in E.N.T., Plastic Surgery, Orthopædic, Skin, and Casualty Departments, should reach Secretary, above address, by 12th August, quoting HH/CO.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Whole-time NON-RESIDENT SENIOR REGISTRAR (Department of Medicine) required.

Detailed applications, names 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, as soon as possible.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON (Senior House Officer grade) required. Duties mainly orthopædic, some E.N.T. and emergency general surgery. New operating-theatre. Outpatient and Casualty Department.

Applications, with copies of 3 testimonials and name and address of 1 referee, to Hospital Secretary.

KING EDWARD MEMORIAL HOSPITAL, Ealing. Senior HOUSE OFFICER required 1st September, 1958, at King Edward Memorial Hospital for duty in Casualty and Fracture Departments. Recognised for 6 months' casualty work for the F.R.C.S. examination. Resident or non-resident.

Applications, giving age, nationality, qualifications and experience, with dates, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 7th August, 1958.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies (1 resident, 1 non-resident) occur 1st October, 1958, for HOUSE PHYSICIANS. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and Special Clinics as well as in wards. The resident post will be attached to the Cardiological firm during the 4 months in London.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th August.

J. ROBBINS, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs 1st October, 1958, for RESIDENT SURGICAL OFFICER. Appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer, or Registrar, according to qualifications and previous surgical experience.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 recent testimonials, should reach the undersigned not later than 20th August. J. ROBBINS, House Governor.

London Chest Hospital, E.2.

DREADNOUGHT SEAMEN'S HOSPITAL, Greenwich, S.E.10. CASUALTY AND RECEIVING ROOM OFFICER (non-resident) required on 1st September. Post recognised by the Royal College of Surgeons. Salary £819 10s. p.a.

Applications, stating age, nationality, qualifications and experience, with the names of 3 recent referees, should be sent to the Secretary at the above address not later than 16th August.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. HAREFIELD AND NORTHWOOD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (House Officer grade) required.

Applications, with copies of testimonials, to the Administrative Officer.

MILDMAY MISSION HOSPITAL, Austin-street, London, E.2. Applications are invited for the pre-registration post of RESIDENT HOUSE SURGEON (post recognised for F.R.C.S.) vacant on 31st July, 1958. Candidates should be in sympathy with the evangelical Christian aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent as soon as possible.

MILE END HOSPITAL, Bancroft-road, London, E.1. (479 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 20th August, 1958.

Application forms, obtainable from Physician-Superintendent, to be returned by 8th August, 1958, with copies of not more than 3 testimonials.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. (General Hospital of 158 Beds.) Applications are invited to fill the undermentioned posts:—

CASUALTY OFFICER (Senior House Officer). Resident or non-resident. Non-resident candidates required to undertake certain night and weekend duties.

HOUSE SURGEON (general). Pre-registration post. Vacant 17th September. Applications by post-registration candidates will also be considered.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary by 12th August.

NORTH MIDDLESEX HOSPITAL, London, N.18. Senior HOUSE OFFICER (paediatrics), resident, required for 1st October (Locum 13th–30th September). Appointment for 6 months in the first instance, with possible extension to 1 year. Previous experience desirable. Recognised for D.C.H.

Applications, giving full particulars, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 13th August.

PLAISTOW HOSPITAL, Samson-street, E.13. (211 Beds.) Applications are invited for the appointment of RESIDENT HOUSE OFFICER (post-registration or pre-registration second post) for 6 months commencing 1st October, 1958, in the Chest Unit and Infectious Diseases Unit (if possible, appointment to be preceded by 2 weeks' Locum); some experience in diseases of the chest desirable. The position offers good opportunity for experience in general medicine.

Applications, with copies recent testimonials, to Hospital Secretary by 13th August, 1958.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2; Shadwell, E.1; and BANSTEAD, SURREY. HOUSE OFFICER appointment for 2 consecutive periods of 6 months, commencing 1st October, 1958; first period House Physician, Hackney-road (6 months); second period House Surgeon, Hackney-road (2 months) and Casualty Officer, Shadwell (4 months).

Application forms may be obtained from the Secretary at Hackney-road, and should be returned, with not more than 3 testimonials, not later than 16th August, 1958.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. SENIOR CASUALTY OFFICER (Male or Female, Senior House Officer grade) for 1 year commencing 19th September, 1958. Post recognised for F.R.C.S. (i.e., half the year is recognised as casualty and half as general surgery).

Applications, with names of 2 referees, to Hospital Secretary by 15th August, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited from registered medical practitioners for the post of RESIDENT PATHOLOGIST (Senior House Officer). The post is for 1 year from 1st October, 1958. Salary and conditions of service as laid down by the Ministry of Health.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned not later than 16th August, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER. The appointment is full-time, resident, for 6 months, duties to commence on 1st October, 1958. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned not later than 15th August, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited for the post of SENIOR RESIDENT ANÆSTHETIST. The appointment is for 6 months, duties to commence 1st October, 1958. Salary in accordance with the Ministry of Health scale for House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned not later than 20th August, 1958.

ROYAL FREE HOSPITAL, Gray's Inn-road, W.C.1. Applications are invited for the post of JUNIOR RESIDENT ANÆSTHETIST. The appointment is for 6 months, duties to commence 1st October, 1958. Salary in accordance with the Ministry of Health scale for House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, to whom they should be returned not later than 20th August, 1958.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Medicine to fill a vacancy in the approved establishment at the Bermondsey and Southwark Group of hospitals, for duties at New Cross General Hospital, Avonley-road, S.E.14, as from 1st October, 1958. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 16th August, 1958.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from registered Women practitioners for the post of Part-time NON-RESIDENT CASUALTY OFFICER (Senior House Officer grade) to attend every morning. The appointment is for a period of 6 months commencing 1st October, 1958.

Forms of application from the Secretary.

ST. ANN'S GENERAL HOSPITAL, The Green, N.15. Applications are invited for the appointment of RESIDENT HOUSE SURGEON (third post) to above Hospital for a period of 6 months from 23rd August, 1958.

Application form from Secretary, Tottenham Group Hospital Management Committee, to be returned by 15th August, 1958.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (576 Beds.) Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics (non-resident). Recognised for D.A. Post vacant 1st November. A General Hospital with departments of general, orthopædic, thoracic and plastic surgery. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 20th August.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (576 Beds.) Applications are invited for the post of Whole-time REGISTRAR in General Medicine. Post vacant mid-October. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 20th August.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (576 Beds.) Applications are invited for the post of Whole-time REGISTRAR for orthopædic, fracture and plastic wards (60 Beds). Applicants must hold F.R.C.S. and have preferably had experience in these specialties. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary to Committee, Paddington Group Hospital Management Committee, Harrow-road, W.9, by 20th August.

ST. CLEMENT'S HOSPITAL, 2a, Bow-road, London, E.3. BOW GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for observation ward and Psychiatric Unit. Resident or non-resident. Regular case conferences are held with visiting Consultant Psychiatrists from the London and Claybury Hospitals, and facilities exist for postgraduate study. The post is recognised for D.P.M. regulations.

Applications, giving full details and the names of 2 referees, to Group Secretary, Committee Offices, 2A, Bow-road, London, E.3, within 2 weeks of publication of this advertisement.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (General—192 Beds.) Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE PHYSICIAN for 6 months.

Applications, with 2 recent testimonials, to be sent to the Hospital Secretary by 16th August, 1958. Applications may be sent in pending the qualifying examination results being known, and provided these are available at the date of interview.

ST. MARY'S HOSPITAL FOR WOMEN AND CHILDREN, Upper-road, Plaistow, London, E.13. RESIDENT SENIOR HOUSE OFFICER (general medicine) required for period of 12 months, commencing 14th September, 1958.

Apply to Hospital Secretary, naming 3 referees, by 9th August, 1958.

ST. NICHOLAS HOSPITAL, Plumstead, S.E.18. House SURGEON. Vacant 18th August. 6 months' appointment. Approved for pre-registration service and recognised for F.R.C.S.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR. General medical duties (some tuberculosis). Non-resident.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, London, S.W.3.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR. General medical duties. Non-resident.

Application forms from the Group Secretary, St. Luke's Hospital, Sydney-street, London, S.W.3.

ST. THOMAS'S HOSPITAL and the SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. (Joint appointment.) Whole-time SENIOR REGISTRAR to the Children's Department at St. Thomas's and Lambeth Hospitals, for 1 year in the first instance from 1st October, 1958. 8 sessions per week at St. Thomas's Hospital and 3 sessions per week at the Lambeth Hospital.

Applications (9 copies), naming 3 referees, to the Clerk of the Governors, St. Thomas's Hospital, S.E.1, by 19th August, 1958.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WANSTEAD HOSPITAL, Harmon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER (recognised for F.R.C.S.). Graded Senior House Officer. Vacant 14th August, 1958. Salary £819 10s. p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WHIPPS CROSS HOSPITAL, London, E.11. Leytonstone (No. 10) HOSPITAL GROUP. Applications are invited from fully registered medical practitioners for the post of HOUSE OFFICER in the Geriatric Unit at above Hospital. This post, vacant 4th August, 1958, offers excellent scope for persons interested in this specialty, as the most modern methods of geriatric treatment are employed.

Application forms, obtainable from the Hospital Secretary, to be returned by 12th August, 1958.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for an appointment as SENIOR HOUSE OFFICER in the Orthopædic Department of the Aberdeen Royal Infirmary. The post, which is a whole-time one and non-resident, becomes vacant on 4th October. Salary and conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Group Secretary and Treasurer, Aberdeen General Hospitals, P.O. Box 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOS-PITAL. MID-WALES HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgical) required (resident). Post recognised for F.R.C.S. examination. Vacancy immediate.

Applications, stating age, experience, &c., to the Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cardiganshire.

ALTON GENERAL HOSPITAL, Alton, Hampshire. SENIOR HOUSE OFFICER (medical) with anæsthetics, Senior House Officer grade. 136 Beds. Acute general. Post vacant 1st September, 1958.

Applications to Hospital Secretary.

ALTON, HAMPSHIRE. HENRY GAUVAIN HOSPITAL. (112 Beds.) ALTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for the above Hospital for a period in the first instance of 6 months. Post vacant now. Non-pulmonary tuberculosis, orthopædic and general surgery. Primary or Final F.R.C.S. candidate preferred, married or single, to live in small cottage on estate.

Applications, together with the names and addresses of 3 referees, to Hospital Secretary, Henry Gauvain Hospital, Alton, Hants.

ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Mental Hospital of 1300 Beds. Opportunities available for further study.

Applications, with 2 recent testimonials, should be addressed to the Medical Superintendent as soon as possible.

AYLESBURY. ROYAL BUCKINGHAMSHIRE HOS-PITAL. CASUALTY OFFICER (Senior House Officer) required mid-August. Post recognised for F.R.C.S. Self-contained furnished flat available at moderate rental.

Apply, with copies of 2 recent testimonials, to Secretary-Superintendent.

AYLESBURY. ROYAL BUCKINGHAMSHIRE AND ASSOCIATED HOSPITALS MANAGEMENT COMMITTEE. HOUSE SURGEONS (Male or Female). 2 required for the Aylesbury Group Department of Surgery at Tindal General Hospital. Pre-registration posts, but registered practitioners invited to apply. The posts offer wide experience of general surgery with operative practice; recognised for F.R.C.S. The Acute Surgical Unit consists of 85 Beds. No casualty department.

Apply, with copies of 2 testimonials, to the Administrative Officer.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration); vacant now. The Hospital serves a wide area of pleasant countryside, and the post affords good opportunity to study excellent clinical material.

Apply to Group Secretary, 19, Alexandra-road, Barnstaple, N. Devon.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE PHYSICIAN (pre-registration) required from 5th September, 1958.

Applications, naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BATLEY. THE GENERAL HOSPITAL. (99 Beds.) SENIOR HOUSE SURGEON (orthopædics and general surgery). This Hospital is the main orthopædic hospital in the Group and has 36 orthopædic and 14 general surgery beds. The appointment falls vacant on 10th August, 1958, and is normally held for 12 months. It is recognised by the Royal College of Surgeons of England for a period of 6 months' training for the final examination. If required, a desirable furnished house is available, on rental, close to the Hospital.

Applications, giving full details of present and past appointments and names and addresses of 3 referees, should be forwarded to the Administrative Officer at the General Hospital, Batley, not later than 9th August, 1958.

BEDFORD GENERAL HOSPITAL. (431 Beds.) House SURGEON required immediately. Pre- or post-registration; recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute surgical units.

Inquiries and applications, with copies of 2 recent testimonials, to be sent immediately to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BARRY ACCIDENT AND SURGICAL HOSPITAL. SENIOR HOUSE OFFICER required. House available to rent.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN. Vacant 1st August. Pre-registration post, but fully registered practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Group, Dudley Road Hospital, Birmingham, 18**

(*a*) REGISTRAR (surgical), Dudley Road Hospital, Birmingham, 18. Duties in Casualty Department as required. Higher surgical qualification and experience in general surgery and casualty work an advantage.

(*b*) REGISTRAR (anæsthetics—recognised for F.F.A. R.C.S.). Duties at Dudley Road Hospital and group hospitals. Possession of D.A. desirable.

(2) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (anæsthetics), Coventry and Warwickshire Hospital, Coventry. Experience specialty essential. Recognised F.F.A. R.C.S. Resident.

Application forms from Group Secretaries, to be returned by 11th August, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD and UNITED BIRMINGHAM HOSPITALS. Whole-time SENIOR REGISTRAR in Radiodiagnosis. Duties at Coventry and Warwickshire Hospital and other hospitals in the Coventry Group (9 notional half-days) and United Birmingham Hospitals (2 notional half-days). D.M.R.D. essential. Non-resident.

Application forms from Secretary, Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned by 18th August, 1958.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Senior REGISTRAR in Psychiatry. Duties at Hollymoor Hospital and outpatient clinic, Selly Oak Hospital, Birmingham. Hospital linked with Birmingham University for research in psychiatry and biochemistry. D.P.M. and considerable experience specialty essential. Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals under the interchange scheme agreed between the 2 Boards.

Application forms from Secretary, 10, Augustus-road, Birmingham 15, to be returned by 18th August, 1958.

BIRMINGHAM. THE SKIN HOSPITAL (Inpatients' Department), George-road, BIRMINGHAM, 15. SENIOR HOUSE OFFICER or HOUSE OFFICER (resident) required. Modern well-equipped Inpatients' Department, providing facilities for study of skin diseases. Required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to Group Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS, THE BIRMINGHAM AND MIDLAND HOSPITAL FOR WOMEN, Showell Green-lane, SPARKHILL, BIRMINGHAM, 11. Applications are invited from registered medical practitioners for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON for duty with the Professorial Unit—vacant immediately. The appointment is recognised for D.Obst.R.C.O.G. and M.R.C.O.G.

Application forms obtainable from the House Governor at the above address.

BISHOP AUCKLAND. THE GENERAL HOSPITAL. (350 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment. Accommodation available for married officer with no children.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, by 9th August.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. Applications invited for post of HOUSE OFFICER (surgical—pre-registration). Salary £467 10s.–£522 10s. p.a. less £125 for residential emoluments. Appointment to commence immediately.

Applications, stating age, nationality, qualifications and experience, with copies of 2 testimonials or names of referees, to Hospital Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE.

Royal Infirmary, Blackburn

HOUSE SURGEON required immediately. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Queen's Park Hospital, Blackburn

HOUSE SURGEON required immediately. Recognised for F.R.C.S. and approved for pre-registration purposes.

Apply to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. THE ROYAL INFIRMARY, BOLTON (238 Beds). BOLTON DISTRICT GENERAL HOSPITAL (607 Beds). RESIDENT SENIOR HOUSE OFFICERS in Medicine (2), 1 for each of the above Hospitals. Vacant 22nd August (General Hospital) and 31st August (Royal Infirmary) and tenable for 12 months.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BRISTOL (near). HAM GREEN HOSPITAL, Pill, near BRISTOL. Applications are invited for the post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER in the Chest Diseases Wards of the above Hospital. The Hospital is fully equipped for modern treatment of pulmonary tuberculosis and other diseases of the chest, including regular major thoracic surgery. Opportunity also for work in the Bristol Chest Clinic. Appointment for 1 year—renewable. Post vacant 1st September, 1958.

Applications, with testimonials and names of referees, to the Secretary, Ham Green Hospital, Pill, near Bristol.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (496 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Medical). The appointment, which will be for 1 year in the first instance, is on the terms and conditions of service for hospital medical staff and is at a salary of £819 10s., less a deduction of £150 p.a. in respect of unmarried accommodation provided at the Hospital. The candidate appointed will have general supervision under the Consultant Staff of the 89 Beds for general medicine and will be attached as a Clinical Assistant for occasional duties which may be required in the Regional Departments of Neurosurgery, Thoracic Surgery and Plastic Surgery at the Hospital. As the Senior Resident Medical Officer he will be in charge of the " House " and his duties will include pre-employment medical examinations of staff appointed by the Management Committee. It is customary for the resident nursing staff to be invited to register on the patients' panel of the Senior Resident Medical Officer, who is entitled to retain the appropriate fees receivable.

Applications, containing details of qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, Frenchay Hospital, Bristol, not later than 14th August, 1958.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Snowdon Road Hospital, Fishponds, Bristol (300 Beds—chronic sick, general medical, and dermatological cases), RESIDENT SENIOR HOUSE OFFICER (medical) for 6 or 12 months, commencing 23rd August, 1958.

Applications to be submitted forthwith to the Group Secretary, Southmead Hospital, Bristol.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required at Mortimer House Maternity Hospital (35 Beds), RESIDENT SENIOR HOUSE OFFICER (obstetrics) for 6 or 12 months, commencing 1st November, 1958.

Applications to be submitted forthwith to the Group Secretary, Southmead Hospital, Bristol.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. A Locum ANÆSTHETIC REGISTRAR required from 1st to 28th September, 1958.

Applications, giving details of experience, with the names of 2 referees, to the Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton, 7.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE GROUP HOSPITALS. (78 Beds.) SENIOR HOUSE OFFICER for duties in the E.N.T. Department of the above Group. Vacant beginning of August. Recognised for F.R.C.S. and D.L.O.

Applications, with details of experience, &c., together with names of 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of SENIOR HOUSE OFFICER (orthopædics). Recognised for F.R.C.S. examinations. Salary in accordance with national scale. Vacant 9th August, 1958.

Applications, stating age, qualifications, and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton, as soon as possible.

BRIGHTON GENERAL HOSPITAL. Applications are invited for the appointment of HOUSE SURGEON (orthopædics). Salary in accordance with national scale. This is a pre-registration appointment.

Applications, stating age, qualifications, and experience, and giving the names of 2 referees, should be sent to the Physician-Superintendent, Brighton General Hospital, Elm-grove, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.)

CASUALTY HOUSE SURGEON (duties include work in orthopædic and traumatic unit), end August. Recognised for pre-registration and F.R.C.S.

2 HOUSE PHYSICIANS beginning and mid-September. Pre-registration.

RESIDENT PATHOLOGIST (Senior House Officer grade) for Area Laboratory. Good experience in all branches of clinical pathology. Mid-August. Post recognised for D. Path.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. SUSSEX EYE HOSPITAL. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer grade) and HOUSE SURGEON required end of August. Both posts recognised for F.R.C.S. and D.O. Successful applicant for the post of House Surgeon will be considered for the senior post on completion of 6 months.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BROMLEY HOSPITAL, Kent. Senior House Officer in charge of Casualty Department required end of August for 6 months. Recognised for F.R.C.S.

Apply, stating age, qualifications with dates, previous experience, and naming 3 referees, to Administrative Officer, Bromley Hospital, Kent.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (411 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Medicine at the above Hospital. Post vacant now.

Applications, with the names of 3 referees, to the Hospital Secretary.

BROMSGROVE GENERAL HOSPITAL, Worcestershire. (411 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Surgery at the above Hospital. Post vacant now.

Applications, with the names of 3 referees, to the Hospital Secretary.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BURNLEY GENERAL HOSPITAL (641 Beds). BURNLEY VICTORIA HOSPITAL (171 Beds). RESIDENT HOUSE OFFICERS (surgical). The appointments are approved as pre-registration posts and recognised for F.R.C.S. Subject to satisfactory service, the successful applicants will be favourably considered for appointment as House Physician at the termination of contract as Surgical House Officer.

Applications, with 2 references, to Group Secretary, Burnley General Hospital.

BURNLEY AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BURNLEY GENERAL HOSPITAL. (641 Beds.) SENIOR HOUSE OFFICER to Orthopædic and Casualty Departments. Recognised for F.R.C.S. Resident accommodation available. Post available September.

Applications, with the names of 2 referees, to Group Secretary, Burnley General Hospital.

BURNLEY GENERAL HOSPITAL. (641 Beds.) Resident HOUSE OFFICER (medical). The appointment is approved as a pre-registration post. Vacant 25th September, 1958.

Applications, with 2 references, to Group Secretary, Burnley and District Hospital Management Committee, Burnley General Hospital.

BURTON-ON-TRENT. THE GENERAL HOSPITAL. HOUSE OFFICER (orthopædics) (pre-registration post) required at the above Hospital. Recognised for F.R.C.S.

Applications to Group Secretary as soon as possible.

BURY AND ROCHDALE HOSPITAL GROUPS. Resi-DENT REGISTRAR in Psychiatry. Post now vacant.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

BUSHEY MATERNITY HOSPITAL, Bushey Heath, HERTFORDSHIRE. (50 Beds.) RESIDENT OBSTETRIC HOUSE SURGEON required for above Hospital. 6 months' appointment. Duties include antenatal and other clinics at the Edgware General Hospital, Edgware, Middlesex. Post vacant mid-August, 1958.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Administrator of Edgware General Hospital, Edgware, Middlesex, by 8th August, 1958.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (227 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which becomes vacant mid-September, 1958. Salary £819 10s. p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (277 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months' appointment. Post vacant mid-September. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF ISOLATION HOSPITAL. (219 Beds.) Senior HOUSE OFFICER required at above Hospital. Hospital serves wide area, gives opportunity for study of infectious diseases; has poliomyelitis respiratory unit and medical and convalescent beds. Post vacant late August.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF (near). PRINCE OF WALES ORTHOPÆDIC HOSPITAL, RHYDLAFAR, near CARDIFF. SENIOR HOUSE OFFICER required at above Hospital. Married or single accommodation available.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ROOKWOOD HOSPITAL. Senior House OFFICER (surgical) required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CASTLEFORD, NORMANTON AND DISTRICT HOS-PITAL, HIGHTOWN, CASTLEFORD. RESIDENT SURGICAL OFFICER (Senior House Officer grade) required. Married accommodation available.

Applications as soon as possible to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, HOUSE SURGEON (pre-registration) for 6 months only in the first instance. Post vacant now. The Man or Woman appointed will work primarily in the surgical wards of the Hospital. Hospital recognised for F.R.C.S.

Applications, stating age, qualifications and experience, giving names of 2 persons from whom reference may be obtained, should be sent to the Surgeon-Superintendent.

CHATHAM, KENT. ALL SAINTS' HOSPITAL. Medway AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required for post vacant now; recognised for pre-registration service. Salary £467 10s.–£577 10s. p.a. according to experience.

Applications, stating age, qualifications, nationality and experience, with copies of 3 recent testimonials, to the Hospital Secretary.

CHATHAM, KENT. ALL SAINTS' HOSPITAL. Medway AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. PÆDIATRIC HOUSE PHYSICIAN required. Post vacant now, recognised for D.C.H.; salary on House Officer scale according to experience.

Applications to Hospital Secretary, giving details of experience, qualifications, age and nationality, with copies of recent testimonials.

CHATHAM, KENT. ALL SAINTS' HOSPITAL. Medway and Gravesend Hospital Management Committee. OBSTETRIC HOUSE SURGEON required 9th August, 1958. Post tenable for 6 months; recognised for D.Obst.R.C.O.G. and for pre-registration. Salary £467 10s.–£577 10s. p.a., according to experience.

Applications, stating age, qualifications, nationality and experience, with copies of recent testimonials, to the Hospital Secretary.

CHELMSFORD, ESSEX. BROOMFIELD HOSPITAL. Required, experienced Locum Tenens SENIOR REGISTRAR for 6 months from 1st September, 1958, full residence or only when on duty. Unit has 312 Beds for the treatment of pulmonary tuberculosis in adults. Tuberculous and non-tuberculous thoracic surgery, chest clinics, and mass radiography.

Apply Physician-Superintendent.

CHELMSFORD HOSPITAL MANAGEMENT COMMITTEE. Locum ANÆSTHETIC REGISTRAR required for fortnight during September (1st–14th preferred), for Chelmsford and Essex and St. John's Hospitals.

Applications to Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford, Essex.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL. Woking and Chertsey Group. (430 Beds.) Royal Surrey County Hospital. Guildford Group. (233 Beds.) Locum Full-time E.N.T. REGISTRAR for above and other hospitals in the Groups concerned required from 30th August, 1958, to 14th December, 1958. Recognised for F.R.C.S. and D.L.O. The hospitals may be visited by arrangement.

Applications to Physician-Superintendent, St. Peter's Hospital. Telephone: St. Peter's Hospital, Ottershaw 441; Royal Surrey County Hospital, Guildford 2323.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications invited for:—

Black Notley Hospital, Braintree, Essex (522 Beds)

Post of Locum SURGICAL REGISTRAR, for period 11th–24th August, 1958.

Post of Locum REGISTRAR for Pulmonary Tuberculosis Unit, including non-tuberculous diseases of the chest; also duties at chest clinics. Required 1st September for few months.

Essex County Hospital, Colchester, Essex (181 Beds)

Post of Locum SURGICAL REGISTRAR. Required immediately.

Post of Locum MEDICAL REGISTRAR required from 21st August, 1958.

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of TEMPORARY REGISTRAR required as Resident Casualty Officer for 2–3 months from 15th August, 1958.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards Heath. Mid Sussex Hospital Management Committee. JUNIOR HOUSE SURGEON (Orthopædic and Traumatic Unit). Post now vacant.

Apply Hospital Secretary, stating age, nationality, qualifications and experience, with names of 2 referees.

DARLINGTON MEMORIAL HOSPITAL. (314 Beds.) Applications are invited from Male or Female practitioners for the post of SENIOR HOUSE OFFICER (surgery), vacant 10th August, 1958. The post is recognised for the F.R.C.S. (Eng.). Salary £819 10s. p.a.; deduction of £150 for full residential emoluments. The post is tenable for 6 or 12 months.

Apply with references, stating age and experience, to G. W. Beckwith, Group Secretary.

DERBY. CITY HOSPITAL. Derby No. 1 Hospital Management Committee. Applications are invited for the post of HOUSE PHYSICIAN, pre-registration or Senior House Officer (medicine), for duties in general medicine and pædiatrics. Post vacant early in September.

Applications, stating full details together with copies of 2 recent testimonials, should be sent to the Medical Superintendent, City Hospital, Derby, as soon as possible.

DERBY. CITY HOSPITAL. Derby No. 1 Hospital Management Committee. Applications are invited for the posts of HOUSE SURGEONS (2 vacancies). Pre-registration or Senior House Officer (surgical). Recognised for the F.R.C.S. if held by a Senior House Officer. Posts vacant early in September.

Applications, stating full details, together with copies of 2 recent testimonials, should be sent to the Medical Superintendent, City Hospital, Derby, as soon as possible.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (general surgery). Resident. Vacant 1st September. Recognised for F.R.C.S.

Apply, giving full details and 2 names for reference, to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (orthopædic). Vacant 1st September. Recognised for 6 months' "unspecified" training for F.R.C.S.

Apply, giving full details and 2 names for reference, to Secretary.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL. (128 Beds.) Applications are invited for the pre-registration post of HOUSE OFFICER (general surgery) for either the full 6 months or for a Locum appointment for 4–5 months, commencing 1st September, 1958.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital as soon as possible.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL. (128 Beds.) Applications are invited for the pre-registration post of HOUSE PHYSICIAN (general medicine and pædiatrics) which falls vacant immediately.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital as soon as possible.

DORKING GENERAL HOSPITAL, Horsham-road, Dorking, Surrey. SENIOR HOUSE OFFICER (obstetrics and gynæcology). Vacant 8th September, 1958, for 1 year's appointment. The post is recognised for the D.Obst.R.C.O.G.

Apply to Medical Superintendent.

DORKING GENERAL HOSPITAL, Horsham-road, Dorking, Surrey. Applications are invited for the post of SENIOR HOUSE OFFICER (surgery) in General Surgery, Casualty, Orthopædics, and E.N.T. Vacant 1st September, 1958. Recognised for the F.R.C.S. Married quarters may be available to suitable applicants.

Apply, with testimonials, to the Medical Superintendent.

DORCHESTER. DORSET COUNTY HOSPITAL. House SURGEON (Male or Female) required for resident, pre-registration post becoming vacant early August. Recognised for F.R.C.S. examination and tenable for 6 months.

Applications, stating age, qualifications, together with copy testimonials, to Group Secretary, West Dorset Hospital Management Committee, Damers-road, Dorchester, Dorset.

DORCHESTER, DORSET. HERRISON HOSPITAL. JUNIOR HOSPITAL MEDICAL OFFICER. This Hospital, situate in delightful Hardy country within easy reach of sea and south coast resorts, invites application from a progressive young practitioner prepared to accept clinical responsibility. The Hospital is building a new Admission Block of most modern design and is expanding its activities. Facilities for attendance at Outpatient, Child Guidance, and Neurological Clinics and a Mental Deficiency Colony are available, and there are opportunities for original work. A small self-contained flat is available. The Hospital may be visited by appointment.

Applications, giving age, qualifications, experience and the names of 2 referees, should be sent to the Medical Superintendent.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) JUNIOR HOUSE PHYSICIAN, vacant now. Approved pre-registration post, but fully registered practitioners may apply. Duties to include geriatrics and acute medicine. Good general experience for first house appointment. Married quarters may be available.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE SURGEON (first, second or third post). Vacant now. General surgery, casualty and some orthopædics. Approved pre-registration post. Fully registered practitioners may apply. Married quarters may be available.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, Birmingham Region.

The Guest Hospital, Dudley (154 Beds)

SENIOR HOUSE OFFICER (anæsthetics). Post recognised for F.F.A. R.C.S. and D.A. Successful candidate will be required to visit other hospitals in the Group.

Applications, giving the names of 2 referees, to the Group Secretary, Guest Hospital, Dudley, Worcs.

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

HOUSE OFFICER (medical), pre-registration. Post vacant now.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

DURHAM. DRYBURN HOSPITAL. (303 Beds.) Senior HOUSE PHYSICIAN for Pædiatric Unit of 42 Beds. The appointment is suitable for fully registered practitioners and may be of 6 months' or 1 year's duration from 1st August, 1958. The post is recognised for the D.C.H.

Apply, with particulars of previous experience, and names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

EDINBURGH NORTHERN GROUP OF HOSPITALS. SENIOR HOUSE OFFICER required for Department of Radiotherapy, Western General Hospital.

Applications, with names of 2 referees, to The Medical Superintendent, Western General Hospital, Crewe-road, Edinburgh, 4.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. Appointment of RESIDENT HOUSE SURGEON (third post). Vacant 1st August, 1958. Post provides experience and duties in both general surgery and orthopædics. 6 months' appointment. Post recognised for F.R.C.S. by the Royal College of Surgeons.

Applications, with the names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD. WAR MEMORIAL HOSPITAL, Chase Side, Enfield, Middlesex. RESIDENT SENIOR HOUSE OFFICER required immediately for general medical and surgical duties in acute general hospital of 58 Beds. 12 months' appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, The Ridgeway, Enfield, Middlesex.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, Surrey. RESIDENT HOUSE SURGEON required immediately for Orthopædic, E.N.T., and Eye Departments. Post recognised for F.R.C.S.

Applications from fully or provisionally registered practitioners, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent, as soon as possible, to Group Secretary, at above address.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (704 Beds.) RESIDENT HOUSE PHYSICIAN for Thoracic and Dermatological Departments. Duties to include "take in" of acute general medical cases. 6 months' appointment.

Applications, stating age, qualifications, experience and enclosing copies of up to 3 recent testimonials, to Medical Administrator of Hospital by 16th August, 1958.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (704 Beds.) RESIDENT SENIOR CASUALTY HOUSE OFFICER required at above Hospital. Post recognised for F.R.C.S. purposes.

Apply, stating age, nationality, qualifications and experience, together with the names and addresses of 2 referees, to Group Secretary, Edgware General Hospital, by 9th August, 1958.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. SENIOR HOUSE SURGEON required for E.N.T. Department of above Hospital. Post vacant mid-August, 1958.

Applications, stating age, qualifications, experience and enclosing names and addresses of 2 referees, to Group Secretary, Edgware General Hospital, by 8th August, 1958.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (704 Beds.) Locum RESIDENT HOUSE SURGEON required for the month of September, 1958, at above Hospital.

Applications to the Medical Administrator, telephone EDGware 2381, extension 6.

GAINSBOROUGH. JOHN COUPLAND HOSPITAL. (40 Beds.) Locum RESIDENT MEDICAL OFFICER required. Junior Hospital Medical Officer grade. 18th August–17th September, 1958.

Apply in writing to Group Secretary, County Hospital, Lincoln.

GALASHIELS (near). PEEL HOSPITAL. (220 general beds—full consultant staff.) Applications are invited for the following vacancies arising on 1st October, 1958:—

Orthopædic Department—RESIDENT SENIOR HOUSE OFFICER and RESIDENT HOUSE OFFICER.

Conditions of service in accordance with regulations for National Health Service staff. Opportunity to visit Hospital arranged on application.

Applications, giving full particulars and names of 2 referees, to Group Medical Superintendent, Borders Hospital Board of Management, Peel Hospital, near Galashiels.

GLASGOW. HAWKHEAD (MENTAL) HOSPITAL, 510, Crookston-road, Glasgow, S.W.3. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry (Male or Female), resident or non-resident). The post offers wide experience and training in all aspects of psychiatry (inpatient and outpatient), and all modern methods of treatment are carried out. Recognised for D.P.M.

Applications, together with the names of 2 referees, should be forwarded as soon as possible to Physician-Superintendent at the above address.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. In the undernoted units there are vacancies for HOUSE OFFICERS (recognised for pre-registration) for the 6 months beginning 1st August, 1958.

General surgery.
Acute geriatrics.
E.N.T.

Applications should be addressed to the Medical Superintendent, giving the names of 2 referees.

GRAVESEND AND NORTH KENT HOSPITAL, Gravesend, Kent. MEDWAY AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON. Applications are invited for this pre-registration post, vacant now. Post offers experience in obstetrics, gynæcology, and orthopædics as well as general surgery. Salary £467 10s.–£577 10s. p.a., according to experience.

Applications, stating age, qualifications, nationality and experience, to Hospital Secretary.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, Dene-side, GREAT YARMOUTH. (134 Beds.) HOUSE PHYSICIAN required, House Officer or Senior House Officer status. Post vacant now, recognised for pre-registration service. Membership of a Medical Defence Society is a condition of appointment.

Applications, giving full details, with names of 2 referees, to Hospital Secretary.

GRIMSBY GENERAL HOSPITAL. (Unit of 46 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required for above Hospital. Medical library and reading facilities available.

Applications, with names of 2 referees, to the Hospital Secretary, Grimsby General Hospital, Grimsby.

GRIMSBY GENERAL HOSPITAL. (Recognised for training for F.F.A.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT or RESIDENT (single accommodation only) REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th August, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GRIMSBY GENERAL HOSPITAL. Senior House Officer required for Casualty Department. Establishment consists of Senior Casualty Officer and 2 Senior House Officers. Excellent Medical Library taking principal periodicals.

Applications, with names of 2 referees, to Hospital Secretary.

GRIMSBY. SPRINGFIELD HOSPITAL. (202 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (chest and infectious diseases) required. House available. There is a Thoracic Unit at the Hospital. Some clinic work would be undertaken under Consultant supervision. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th August, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HASTINGS GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum SENIOR HOUSE OFFICER (anæsthetics) required. Non-resident. Salary £15 19s. per week. From 25th August to 14th September, 1958.

Applications, with copies of 2 testimonials or names of 2 referees, to Group Secretary, 11, Holmesdale-gardens, Hastings.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON at the Royal East Sussex Hospital, Hastings. Pre-registration post recognised for F.R.C.S. Vacant 30th August, 1958. The Hospital is pleasantly situated facing the sea and is the main surgical hospital in the Hastings Group. Post offers excellent experience.

Applications, with names of 2 referees, to the Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON. Pre-registration post for general surgery and urology required at this acute hospital (surgical) immediately.

Applications, with names of 2 referees, to Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the posts of CASUALTY AND ORTHOPÆDIC HOUSE SURGEONS (2 posts vacant), graded Senior House Officers, for the Royal East Sussex Hospital, Hastings. Modern department. Hospital is pleasantly situated facing the sea. Posts vacant 2nd and 9th August, 1958, respectively.

Applications, with names of 2 referees, to the Administrator.

HAILSHAM, SUSSEX. HELLINGLY HOSPITAL. Hailsham HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male or Female) for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. The post is a trainee appointment and offers experience in all branches of adult psychiatry. In addition, opportunities can be afforded for some experience in neurology and mental deficiency. The Hospital has a high admission-rate and is recognised for the D.P.M. Married or single accommodation is available.

Applications, giving the names of 3 referees, should be sent to the Medical Superintendent within 14 days of the appearance of this advertisement.

HAREFIELD HOSPITAL REGIONAL THORACIC SURGICAL UNIT, HAREFIELD, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SURGICAL REGISTRAR to the Harefield Thoracic Surgical Unit, which serves the North West Metropolitan Region. In the Hospital there are 86 Beds for non-tuberculous surgical chest conditions and 400 Beds for tuberculosis. The appointment thus affords a wide experience in all aspects of thoracic surgery. Candidates must have had previous surgical experience and preference will be given to candidates with a higher surgical qualification. The appointment will be held in the first instance for 1 year.

Application forms obtainable from and returnable to the Group Secretary, Harefield and Northwood Group Hospitals Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 12th August, 1958.

HARROGATE AND DISTRICT GENERAL HOSPITAL. (253 Beds.) JUNIOR HOSPITAL MEDICAL OFFICER in Casualty and Orthopædic Surgery (recognised for F.R.C.S.) vacant from 1st October. House available on rental (with furniture if required).

Applications, with names of 2 referees, to Hospital Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for appointment of RESIDENT HOUSE PHYSICIAN (Male or Female), second post held. Recognised pre-registration post. Preference given to applicants who have held resident surgical or medical posts in general hospital. Duties to commence 18th August, 1958.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general, first or second post) to commence as soon as possible. Pre-registration post; recognised under F.R.C.S. regulations. Applications will also be considered from fully registered practitioners.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEXHAM GENERAL HOSPITAL, Northumberland. (304 Beds.) HOUSE SURGEON post (pre- or post-registration), combining general surgery with orthopædic experience, vacant in September. Recognised by R.C.S.

Applications, with names and addresses of 2 referees, to Group Secretary, General Hospital, Hexham, as early as possible

HEXHAM GENERAL HOSPITAL, Northumberland. (304 Beds.) HOUSE SURGEON (gynæcology) post, pre- or post-registration. Recognised by R.C.S.

Applications, with names and addresses of 2 referees, to Group Secretary, General Hospital, Hexham, as early as possible.

HIGH WYCOMBE, BUCKINGHAMSHIRE. WAR MEMORIAL HOSPITAL. (100 Beds.) SENIOR RESIDENT HOUSE PHYSICIAN required immediately.

Apply, with copies of testimonials or names of 2 referees, to the Secretary.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (General—621 Beds.) CASUALTY OFFICER. Whole-time duties under Medical Director will include dealing with casualties and admissions to hospital and such other duties as may be required. Post recognised for F.R.C.S. Salary on Junior Hospital Medical Officer scale.

Apply, stating age, nationality, qualifications and experience, together with copies of not more than 3 recent testimonials, to Medical Director by 11th August, 1958.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required from approximately 1st September next at this Hospital which accommodates 404 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Group Secretary,
Huddersfield Hospital Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD ROYAL INFIRMARY. (285 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty on 6th August, 1958. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HOUSE SURGEON or Locum HOUSE SURGEON required on 1st August, 1958. Pre-registration or registration post. The post is recognised for the D.C.H. and is an interesting and varied one which includes outpatient and casualty work.

Applications, together with details of experience, testimonials, &c., should be sent to the Hospital Secretary.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (medical), vacant early August. Post recognised for pre-registration purposes. The selected candidate will be required to look after medical and paediatric cases and may be called upon to give emergency anæsthetics.

Apply, with full particulars and names of 2 referees, to Secretary, County Hospital, Huntingdon.

ILKLEY. MIDDLETON HOSPITAL. (386 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgical) required for Major Thoracic Surgical Unit at the above Hospital. Eminently suitable for person intending to take Membership or Fellowship examination.

Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Anglesea-ROAD WING). (350 Beds.) Applications invited for post of CASUALTY OFFICER (Senior House Officer grade) vacant 1st September, 1958. Post recognised for F.R.C.S. examinations.

Applications, stating age and nationality, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (129 Beds for infectious diseases, pulmonary tuberculosis, long-stay orthopædics and geriatrics. The area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the Ipswich and East Suffolk Hospital (Anglesea-road Wing), Ipswich.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House SURGEON. Duties include plastic surgery and orthopædic surgery (58 orthopædic beds and 18 plastic surgery beds). Large outpatient clinics. Post vacant 17th August, 1958.

Applications to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 12th August.

KETTERING AND DISTRICT GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. The post, vacant early September, 1958, offers wide experience of all traumatic conditions including fractures and some orthopædic cases, with charge of 30 Beds.

Applications, accompanied by testimonials, to be sent to the Group Secretary, General Hospital, Kettering.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-ON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of HOUSE OFFICER (pre-registration—general medicine) which is available on 1st October, 1958.

Applications, stating age, qualifications and experience, with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital within 7 days of the appearance of this advertisement.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Pædiatrics

Bradford A and B Groups. Duties mainly at Children's Hospital (52 Beds). Resident.

Urology

Bradford Royal Infirmary (65 urology beds). Approximately one-fifth of the duties will be general surgical. Non-resident.

General Medicine

Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions), and Rheumatism Clinic, General Infirmary, Leeds (2 sessions). Resident at the Royal Bath Hospital, Harrogate.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 20th August, 1958.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. A vacancy exists for a REGISTRAR as a Trainee Radiologist or with D.M.R. Candidates with higher qualifications in medicine or surgery preferred. Terms and conditions of hospital medical and dental staffs apply. The appointment will be for 1 year in the first instance and renewable thereafter.

Applications, giving details of age, qualifications, previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 1, not later than 8th August, 1958.

LEEDS (near). WOODLANDS ORTHOPÆDIC HOS-PITAL, RAWDON, near LEEDS. (112 Beds.) SENIOR HOUSE OFFICER (resident) required. Post vacant 1st October, 1958.

Applications, stating age and experience, with copies of 2 testimonials, to the Secretary, The Royal Infirmary, Bradford, 9, Yorkshire.

LEAMINGTON SPA. WARNEFORD GENERAL HOS-PITAL. (197 Beds.) Locum HOUSE PHYSICIAN required, 12th–25th September inclusive.

Apply Hospital Secretary.

LEIGH INFIRMARY, The Avenue, Leigh, Lancashire. (102 Beds.) REGISTRAR in General Surgery (resident) for the above Acute General Hospital. Post vacant September, recognised for the F.R.C.S.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

LINCOLN COUNTY HOSPITAL, Sewell-road, Lincoln. (200 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, Male or Female. This is an approved pre-registration post. If satisfactory, this post will be followed by appointment for a second 6 months as House Surgeon.

Applications, with copy testimonials, should be sent to the Secretary as soon as possible.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL ROYAL INFIRMARY. Applications are invited for the resident post of SENIOR CASUALTY OFFICER (Registrar grade) for the period 1st October, 1958, to 30th September, 1959. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply by 16th August, 1958, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL EAR, NOSE AND THROAT INFIRMARY. Applications are invited for a resident post of SENIOR HOUSE OFFICER in Otorhinolaryngology for the year beginning 1st October, 1958.

Apply by 16th August on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER 9. (380 Beds.) Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST, Senior House Officer grade, which will become vacant during August, 1958. The post, which is tenable for 1 year, affords opportunities for training in all branches of pathology. Candidates should have held house appointments, but previous experience in pathology is not essential.

Application form from Group Secretary.

MANCHESTER. BOOTH HALL CHILDREN'S HOS-PITAL, BLACKLEY, MANCHESTER, 9. (380 Beds. Recognised for D.C.H.)

RESIDENT SENIOR HOUSE OFFICER (surgical). Duties orthopædic and E.N.T. Post vacant 1st August.

Applications, giving names and addresses of 2 referees, to be sent to Group Secretary, from whom further particulars may be obtained.

HOUSE OFFICER (surgical), pre- or post-registration. Duties mainly general surgery and neurosurgery. Post vacant.

Applications immediately, with usual particulars and copies of 2 recent testimonials, to Group Secretary.

MANCHESTER, 8. CRUMPSALL HOSPITAL. Applica-tions are invited for the post of REGISTRAR in Obstetrics and Gynæcology at the above Hospital. Vacant 1st October, 1958. Preference will be given to applicants who possess the M.R.C.O.G. This post offers extensive clinical experience and is recognised for the M.R.C.O.G.

Applications, with names of 2 referees, by 11th August, 1958, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Anæsthetics to the West Manchester Hospital Management Committee, with duties primarily at Park Hospital, Davyhulme, but with duties at other hospitals within the Group. Post now vacant.

Applications, giving full details, and including names of referees, to Group Secretary, Park Hospital, Davyhulme, Manchester.

MANCHESTER REGIONAL HOSPITAL BOARD. Appli-cations are invited for the post of REGISTRAR in General Medicine to the Burnley and District Group of hospitals. Excellent resident accommodation is available for single or married applicants. The post provides wide experience in general medicine.

Applications, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Burnley General Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD. Appli-cations are invited for the resident post of REGISTRAR in General Surgery in the Burnley and District Hospital Management Committee with main duties at the Reedyford Memorial Hospital, Nelson. The post is recognised for F.R.C.S. and good accommodation is available in a modern self-contained flat. Post available 10th August.

Applications, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Burnley General Hospital, Burnley.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the post of SURGICAL REGISTRAR at the North Lonsdale Hospital, Barrow-in-Furness. The post may be resident or non-resident, as desired, but single residential accommodation only is available. Recognised for F.R.C.S. Available beginning of September.

Applications should be addressed to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

MANCHESTER. ROYAL MANCHESTER CHILDREN'S HOSPITAL. Locum RESIDENT SURGICAL OFFICER (Registrar grade) required at the above Hospital from 16th August to 28th September, 1958.

Applications to Group Secretary, Salford Hospital Management Committee, Salford Royal Hospital, Salford, 3.

MANCHESTER NORTHERN HOSPITAL. Applications are invited for the resident post of SENIOR HOUSE OFFICER in Gynæcology. Recognised for M.R.C.O.G. Vacant 14th September, 1958.

Applications, with names of 2 referees, by 11th August, 1958, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MANCHESTER. UNITED MANCHESTER HOSPITALS, SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for 3 posts of SENIOR HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The posts are recognised for the purpose of the M.R.C.O.G. examination. The appointments are for 6 months starting 1st October, 1958. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 18th August, 1958.

A. R. WISE,
General Superintendent, Saint Mary's Hospitals.
Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER.

Application forms may be obtained from the undersigned.

H. R. NORTH, General Superintendent.
Manchester Royal Eye Hospital.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. ECCLES AND PATRICROFT HOSPITAL, ECCLES. (General hospital—47 Beds.) RESIDENT SENIOR HOUSE OFFICER required. The work of the Hospital is mainly surgical and there is a busy Casualty Department. The person appointed will be one of 2 resident Senior House Officers.

Applications, giving full details, together with names and addresses of 2 referees, to Group Secretary, Park Hospital, Davyhulme, Manchester.

MEXBOROUGH. MONTAGU HOSPITAL AND ANNEXE. (198 Beds.) Locum SENIOR HOUSE OFFICER (casualty and orthopædics). £150 p.a. residential emoluments.

Applications to the Secretary to the Committee, "Fern Bank", Doncaster-road, Rotherham.

MITCHAM JUNCTION, SURREY. WANDLE VALLEY HOSPITAL. RESIDENT MEDICAL OFFICER (Senior House Officer grade). Vacant 9th August. The Hospital contains 152 Beds for infectious diseases and geriatric cases.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be sent to the Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) HOUSE SURGEON, Accident and Admission Department. Recognised for F.R.C.S. diploma.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4, as soon as possible.

NEWCASTLE GENERAL HOSPITAL. (800 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER, Orthopædic Department. Vacant 23rd August, 1958. Recognised for F.R.C.S. diploma. A new orthopædic ward is planned to come into service in September, 1958.

Applications, together with names and addresses of 2 referees, should be sent to the Secretary, Newcastle General Hospital, Newcastle upon Tyne, 4.

NEWCASTLE HOSPITAL MANAGEMENT COM-MITTEE. SENIOR HOUSE OFFICER (Ophthalmologist) whole-time, Newcastle Hospital Management Committee, Eye Unit. Recognised for D.O. Hospitals—Newcastle (838 Beds), Walker Gate (309, 42 ophthalmic beds), Walker Accident (21 ophthalmic beds).

Applications, with names and addresses of 3 referees, to the Hospital Secretary, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR ANÆSTHETIST, whole-time, for South Shields Group of hospitals—main hospitals General (549 Beds), Ingham Infirmary (165 Beds). Post recognised for F.F.A. R.C.S. examination. Furnished married, or single, accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD and UNITED NEWCASTLE UPON TYNE HOSPITALS. 2 PÆDIATRIC REGISTRARS, whole-time, for Newcastle upon Tyne Group of hospitals. 1 post available 1st October, 1958, and 1 available 1st September, 1958. Posts designed to give wide experience in pædiatrics, and circulation may include the Teaching Hospital, Hospital for Sick Children, Newcastle General Hospital, and Walker Gate Hospital.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the resident appointment of SENIOR HOUSE OFFICER in the Children's Department of the Royal Victoria Infirmary. The department is responsible for the care of patients in the children's wards and outpatient clinic of the Royal Victoria Infirmary and in the Babies' Hospital and for the care of infants in the Princess Mary Maternity Hospital. The appointment is for 1 year and will be subject to terms and conditions of service of hospital medical staff in the National Health Service. The successful candidate will work at the Princess Mary Maternity Hospital.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWBURY DISTRICT HOSPITAL, Newbury, Berkshire. Locum RESIDENT SURGICAL OFFICER (Senior House Officer grade) required for period 1st–14th September, 1958.

Applications to Secretary.

NORTHAMPTON (near). CREATON HOSPITAL. Applications are invited from suitably qualified medical practitioners for the post of SENIOR HOUSE OFFICER. The Hospital has 138 Beds, and is for the treatment of both pulmonary and non-pulmonary tuberculosis. There is a major thoracic surgical unit for tuberculosis and non-tuberculous diseases of the chest.

Applications, stating age, experience and qualifications, together with the names and addresses of 2 referees, should be sent to the Secretary, Northampton and District Hospital Management Committee, General Hospital, Northampton, within 7 days of the appearance of this advertisement.

NORWICH. NORFOLK AND NORWICH HOSPITAL. Applications are invited for the following appointments :—

ORTHOPÆDIC HOUSE SURGEON. 2 House Officers employed in the Department.

HOUSE SURGEON at the West Norwich Hospital. Post recognised for final F.R.C.S. examination requirements. Duties general surgical, and including burns and plastic work. The beds at this Hospital are under the control of the Consultant Staff of the Norfolk and Norwich Hospital.

Locum SURGICAL REGISTRAR at the West Norwich Hospital, for 3 months from the 24th August, 1958, whilst permanent holder of post is on study leave. Resident or non-resident. Salary £26 8s. per week in accordance with terms and conditions of service of hospital medical staff.

Membership of a Medical Defence Society is a condition of appointment in each case.

Applications, stating age, qualifications, and experience, together with names of 2 referees, to Group Secretary, Hospital Management Committee, St. Stephen's-road, Norwich.

NOTTINGHAM CHILDREN'S HOSPITAL. (136 Beds. Recognised for the D.C.H.) Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) which will be vacant end of August. The post is tenable for 6 months or a year by agreement.

Applications, with copies of 2 testimonials, should be sent to the Secretary, Nottingham Children's Hospital, Chestnut-grove, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (general surgery) vacant 16th September, 1958. The post is approved for the F.R.C.S. The officer appointed will also be required to undertake certain duties in the Orthopædic Department. A deduction of £150 p.a. will be made for residential emoluments.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (811 Beds. Recognised for training for the D.A. and F.F.A. R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (anæsthetics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th August, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM CITY HOSPITAL. (811 Beds. Recognised for training for M.R.C.O.G.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th August, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), duties to commence 30th September.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (anæsthetics) required 31st August, 1958. The post is recognised for the D.A. and the F.F.A. R.C.S. This is a busy general hospital giving experience in all branches of surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Senior House OFFICER (surgery) required. Duties to commence immediately.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. 2 House SurGEONS. Pre-registration. Duties to commence as soon as possible.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

ORPINGTON HOSPITAL, Orpington, Kent. Pre-registration HOUSE OFFICER for Orthopædics and E.N.T. Post now vacant offers good experience in large general hospital; pleasantly situated within easy reach of London.

Apply immediately to Surgeon-Superintendent (ORPington 27050).

OLDHAM AND DISTRICT GENERAL HOSPITAL. Applications are invited for the posts of HOUSE SURGEONS, becoming vacant on 2nd August and 24th August, 1958. The posts are recognised for pre-registration purposes and F.R.C.S.

Applications should be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham, quoting Ref. No. G/40.

OLDHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Locum SENIOR HOUSE OFFICER (general surgery). Vacant immediately, with duties at the Oldham Royal Infirmary and/or the Oldham and District General Hospital. The appointment will be tenable for a period of approximately 6 months.

Applications, quoting full particulars of qualifications and experience, together with the names and addresses of 2 referees, should be sent immediately to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham.

OLDHAM ROYAL INFIRMARY. Applications are invited for the posts of HOUSE SURGEONS, 1 vacant immediately and 1 becoming vacant on 1st August, 1958. The posts are recognised for pre-registration purposes and F.R.C.S.

Applications should be forwarded to the Group Secretary, Oldham and District Hospital Management Committee, Central Offices, Rochdale-road, Oldham, quoting Ref. No. G/39.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in General Surgery to the hospitals of Aylesbury and High Wycombe Hospital Management Committees, with duties mainly at Stoke Mandeville and Amersham Hospitals. Vacant 1st October, 1958. Post recognised for the F.R.C.S. The appointment will be for 1 year and eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, should reach him by 16th August, 1958.

PAISLEY. ROYAL ALEXANDRA INFIRMARY. House SURGEONS (general) required for above Infirmary as from 1st August, 1958. Posts approved for pre-registration practitioners and F.R.C.S.

Applications to Group Medical Superintendent.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. HOUSE SURGEON, pre-registration post, vacant immediately.

Apply, with names of 3 referees, also stating age, nationality, qualifications and experience, to the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Saint Mary's Hospital

Surgery (120 surgical beds)

HOUSE OFFICER (pre-registration). Vacant 12th August.

Royal Portsmouth Hospital (104 orthopædic beds)

SENIOR HOUSE OFFICER required in Orthopædic Department. Vacant 2nd August.

ORTHOPÆDIC HOUSE OFFICER (pre-registration). Vacant now.

Queen Alexandra Hospital

General Medicine and Dermatology (78 medical beds and 24 dermatology beds)

SENIOR HOUSE OFFICER. Vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST, St. Mary's Hospital, Milton-road, Portsmouth.

PRESTON ROYAL INFIRMARY. (400 Beds.) Senior HOUSE OFFICER in Orthopædics. Post recognised for F.R.C.S. Post vacant now.

Applications, with names of 2 referees, to Group Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston.

PRESTON ROYAL INFIRMARY. (400 Beds.) Post- or Pre-registration HOUSE SURGEON. Post vacant mid-August. Recognised for F.R.C.S.

Applications, with names of 2 referees, to Group Secretary, Preston and Chorley Hospital Management Committee, Royal Infirmary, Preston.

READING. BATTLE HOSPITAL. (391 Beds.) Reading AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON (pre- or post-registration) required in the Accident and Orthopædic Department. F.R.C.S. recognised. Also casualty duties. Vacant immediately.

Apply, stating age, qualifications with dates, nationality, present post, with copy of recent testimonial, to Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (337 Beds.) Applications are invited from registered and provisionally registered medical practitioners for the resident post of HOUSE PHYSICIAN in the Pædiatric Department, vacant 1st September, 1958, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st September, 1958, and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copies of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. RESIDENT HOUSE SURGEON (Male). Pre-registration appointment vacant immediately. Opportunity of House Physician's post to follow if required.

Applications to Hospital Secretary.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required at Birch Hill Hospital. Resident post now available.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

ROCHDALE GROUP OF HOSPITALS. Locum Junior HOSPITAL MEDICAL OFFICER (anæsthetics) required immediately. 6 months' appointment.

Apply at once to the Group Secretary, Birch Hill Hospital, Rochdale.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (surgery) required for busy Surgical Unit. Post recognised for F.R.C.S. qualification and offering excellent experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, Lancs.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited from registered medical practitioners for the post of HOUSE OFFICER in Pædiatrics and General Medicine, at the above Hospital. Post tenable for 6 months.

Applications, stating age and experience, with copies of 2 testimonials, to be sent to the Group Secretary, Clwyd and Deeside Hospital Management Committee, Rhiana, Russell-road, Rhyl.

RICHMOND, SURREY. ROYAL HOSPITAL. (121 Beds.) SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified and experienced medical officers for the appointment of Full-time RESIDENT REGISTRAR (general surgery) which will become available shortly. Single or married quarters will be available.

Forms of application may be obtained from the Group Secretary (a foolscap stamped addressed envelope to be enclosed), and the completed forms should be returned to the Group Secretary, 35, Coombe-road, Kingston, as soon as possible.

ROCHFORD GENERAL HOSPITAL, Essex. (620 Beds.) SENIOR HOUSE OFFICER (surgery) required. Post recognised for F.R.C.S., and is resident. Vacant approximately 24th August.

Applications, stating age, &c., to reach the Secretary by 16th August, 1958.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE PHYSICIANS (2) required from 3rd and 10th September, 1958, respectively. Open to either pre-registration applicants or to fully registered practitioners.

Apply immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) required from 24th August and 10th September, 1958, respectively, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully registered practitioners. This very active Unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to a unit of approximately 60 Beds.

Apply immediately to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) ORTHOPÆDIC HOUSE SURGEON (resident) required in the Orthopædic and Accident Unit. The service consists of 100 Beds equally divided between traumatic surgery and "cold" orthopædics. Post is recognised for pre-registration purposes and for F.R.C.S.

Applications to be sent to Group Secretary, Romford Hospital Management Committee, Oldchurch Hospital, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. Resident PATHOLOGIST (Senior House Officer grade). This post, which will become vacant on 1st October, 1958, provides valuable experience by rotation through all departments of this large Group Laboratory and is recognised for the purposes of the Diploma in Pathology. Prospective candidates are invited to visit the laboratory.

Applications should be sent with testimonials or the names of 2 referees, before 18th August, 1958, to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) TEMPORARY SURGICAL REGISTRAR (Male) required immediately.

Applications to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD. RUSH GREEN HOSPITAL. Locum MEDICAL REGISTRAR required immediately for period of 3–6 months. Male or Female. Resident or non-resident.

Apply at once to Medical Superintendent. Telephone: Romford 46066.

ROTHERHAM HOSPITAL, Doncaster-gate, Rotherham. (161 Beds. Recognised for F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required 3rd September. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th August, 1958, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

RUGBY. HOSPITAL OF ST. CROSS. House Surgeon in General Surgery (pre-registration). Recognised F.R.C.S. Resident.

Applications to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR SURGICAL REGISTRAR required 11th–30th August.

Applications, with names of 2 referees, to Secretary.

SALFORD. LADYWELL HOSPITAL (Chest Unit—110 Beds). SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. The post is tenable for a maximum period of 4 years. Previous experience in the treatment of pulmonary tuberculosis is desirable. There is a visiting Thoracic Surgeon and the surgery is undertaken at Baguley Hospital, Manchester, which is nearby. Salary in accordance with scale.

Applications, stating age, qualifications and experience, together with the names of 2 referees, should be submitted immediately to the Hospital Secretary, Ladywell Hospital, Salford, 5, Lancs.

SALFORD 6, LANCASHIRE. HOPE HOSPITAL. SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of PÆDIATRIC HOUSE OFFICER (post-registration) which becomes vacant on 14th August, 1958. The post is recognised for the D.C.H.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Hospital Secretary forthwith.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Obstetrics and Gynæcology in the Edinburgh Northern Group of hospitals, as from 1st October, 1958.

Apply, giving particulars of age, previous experience and qualifications, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR at Dingleton Mental Hospital, Melrose. During the tenure of the post opportunities for interchange of duty and training at other centres in the Region may be available under the joint training scheme of the South-Eastern Regional Hospital Board and the Department of Psychological Medicine of the University of Edinburgh. A house is available.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR to the Royal Edinburgh Hospital for Mental and Nervous Disorders. During the tenure of the post opportunities for study and interchange of duty and training at other centres in the Region may be available under the joint training scheme of the South-Eastern Regional Hospital Board and the Department of Psychological Medicine of the University of Edinburgh. Single accommodation available. The Hospital may be visited by arrangement with the Physician-Superintendent.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR to the Royal Edinburgh Hospital for Mental and Nervous Disorders, for work in the first instance in the Professorial Unit at the Jordanburn Nerve Hospital. During the tenure of the post opportunities for study and interchange of duty and training at other centres in the Region may be available under the joint training scheme of the South-Eastern Regional Hospital Board and the Department of Psychological Medicine of the University of Edinburgh. Single accommodation available. The Hospital may be visited by arrangement with the Physician-Superintendent.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR to the Rosslynlee and Haddington Mental Hospitals. During the tenure of the post opportunities for interchange of duty and training at other centres in the Region may be available under the joint training scheme of the South-Eastern Regional Hospital Board and the Department of Psychological Medicine of the University of Edinburgh.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Surgery at Roodlands General Hospital, Haddington. Single quarters are being provided. Modern and expanding hospital with new surgical unit and good outpatient department.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd August, 1958.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Special Training Scheme. Applications are invited for the post of REGISTRAR in Psychiatry, the appointment to be held for 1 year at the Psychiatric Unit of the Southern General Hospital under the direction of the Professor of Psychological Medicine of the University of Glasgow. The second year is to be spent at a mental hospital or mental hospitals in the region. The aim is to provide a comprehensive training in all branches of psychiatry. Candidates will be expected to attend the Post-graduate Course in Psychiatry which will be provided by the University of Glasgow.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 16th August, 1958.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the following posts :—

(*a*) RESIDENT SURGICAL OFFICER (Registrar grade), Royal Hospital (vacant 1st September). Post ideal for candidates working for Final F.R.C.S. Holder acts as Registrar to a General Surgical Unit. Closing date 12th August.

(*b*) REGISTRAR or SENIOR HOUSE OFFICER, Department of Neurosurgery, Royal Infirmary (vacant 25th August). Previous experience welcome but not essential. This post, which if desired could be held for 6 months only, offers experience in management of head injuries as well as a wide range of surgical neurology. Closing date 9th August.

(*c*) SENIOR HOUSE OFFICER in Dermatology, Royal Infirmary. Apply immediately.

(*d*) SENIOR HOUSE OFFICER in Psychiatry (resident) to work under the Professor of Psychiatry in newly established department. Closing date 8th August.

Applications for posts (*a*) and (*b*), with names of 3 referees, to Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

Applications for posts (*c*) and (*d*), with names of 3 referees, or in the case of (*d*) copy testimonials, to the Superintendent, Royal Infirmary, Infirmary-road, Sheffield, 6.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Vacancy early August for HOUSE SURGEON—Senior House Officer/pre-registration (general surgery and gynæcology). Modern well-equipped Hospital offering good experience.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (262 Beds.) Immediate vacancy HOUSE SURGEON (pre-registration or Senior House Officer), mainly general surgery with some E.N.T. and casualty relief. Offers extensive experience of pre- and post-operative surgery.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHREWSBURY. CROSS HOUSES HOSPITAL. OBSTETRIC HOUSE SURGEON. Pre-registration post. Vacant 1st September, 1958.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON. Vacant immediately. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOSPITAL. HOUSE SURGEON required for general surgical duties, pre- or post-registration. Post vacant immediately; recognised by B.C.S. for Fellowship.

Applications to Secretary, Southlands Hospital, Shoreham-by-Sea. A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

SOUTHEND GENERAL HOSPITAL. Locum Anæsthetic REGISTRAR required for the period 10th August–9th September, 1958.

Applications, stating age, previous experience, &c., should be sent to the undersigned immediately. J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Locum SENIOR SURGICAL REGISTRAR required for the period 25th August–13th September, 1958, or 1st–20th September, 1958, inclusive.

Applications, &c., to be sent to the undersigned immediately.
J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited from fully registered practitioners for the post of RESIDENT HOUSE PHYSICIAN (House Officer grade). Post vacant 2nd September, 1958. Appointment primarily to Pædiatric Department, with duties in Cardiological and Skin Departments. Post recognised for D.C.H.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials, should reach the undersigned at the hospital by 7th August, 1958.
J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration and F.R.C.S.) HOUSE SURGEON (general surgery and gynæcology). Post vacant now.

Apply, with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as REGISTRAR in Neurosurgery at the Neurosurgical Unit at Hurstwood Park Hospital, Haywards Heath, Sussex. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience, with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 23rd August, 1958.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for 2 pre-registration posts of HOUSE OFFICER (medicine), 1 post vacant now and the other on 21st August, 1958.

Applications, with full particulars and names of 2 persons for reference, to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOCKPORT. STEPPING HILL HOSPITAL. (529 Beds.) Applications are invited for the post of HOUSE OFFICER (general surgery).

Applications, with copies of 2 testimonials, to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. Post vacant very shortly.

Detailed applications, with copy testimonials, to Hospital Secretary, North Staffordshire Royal Infirmary, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (general medicine and dermatology) required. Pre-registration post. Post vacant very shortly.

Detailed applications, with copy testimonials, to Hospital Secretary, North Staffordshire Royal Infirmary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN (general medicine and pædiatrics) required. Pre-registration post, vacant very shortly.

Detailed applications, with copy testimonials, to Hospital Secretary, North Staffordshire Royal Infirmary, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (general medicine—pre-registration appointment) required. The post offers wide experience in general medicine and cardiology.

Applications to the Hospital Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (815 Beds.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required immediately. The post offers wide experience in general, thoracic and cardiac surgery. No casualty work. Recognised for the F.R.C.S.

Applications to the Hospital Secretary.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. BIRMINGHAM REGIONAL HOSPITAL BOARD. RESIDENT HOUSE OFFICER (obstetrics and gynæcology) required, vacant towards end of August. Pre-registration post. Recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications to Hospital Secretary as soon as possible.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time ANÆSTHETIC REGISTRAR required. Post recognised for F.F.A.R.C.S. and D.A., and vacant about 27th August, 1958. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts.

ST. ALBANS, HERTFORDSHIRE. NAPSBURY MENTAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER. Appointment to commence immediately. Previous experience as House Physician or House Surgeon essential. Previous psychiatric experience desirable but not essential. Regular clinical case conferences, good psychiatric library, and other training facilities. Salary £819 10s. p.a. Residential accommodation is available, if required, for which a charge will be made.

Applications, with references or testimonials, to be sent not later than 9th August, 1958, to the Medical Superintendent (Telephone: Bowmansgreen 3333).

SULLY HOSPITAL, Sully, Glamorganshire. (Thoracic centre of 324 Beds.) SENIOR HOUSE OFFICER (surgical)—applicants primarily interested in general surgery considered. Experience will be gained in investigation and treatment of chest and heart conditions.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

SWANSEA HOSPITAL, Swansea. (413 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Traumatic and Orthopædic Department of the above Hospital. The post is recognised under the F.R.C.S. regulations for 6 months' casualty training. It offers exceptional experience in all aspects of traumatic surgery as occurring in a large industrial centre and port.

Applications, stating age and experience, together with copies of 2 recent testimonials, should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications invited for 2 appointments of SENIOR HOUSE OFFICER as Casualty Officer and Orthopædic House Surgeon at Great Western Hospital, Swindon, vacant early in September. Posts recognised by R.C.S. for 6 months of year's training under Fellowship regulations. Work of Accident and Orthopædic Department, associated with Nuffield Orthopædic Centre, Oxford, includes large number of industrial injuries. Salary £819 10s. p.a., less residential emoluments.

Full details and names of 3 referees to Secretary, 7, Okus-road, Swindon, Wilts.

TORQUAY. TORBAY HOSPITAL. (180 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required early September, 1958. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality, and age, together with copy testimonials (quoting reference F.955/84) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. (Regional Thoracic Centre.) Applications invited for positions of SENIOR HOUSE PHYSICIAN and SENIOR HOUSE SURGEON. Salary £819 10s. p.a. £150 p.a. charged for accommodation.

Address written applications, giving full personal particulars, details of experience and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. SENIOR HOUSE OFFICER required for the Orthopædic Department. Salary £819 10s. p.a., £150 p.a. charged for accommodation.

Address written applications, giving full particulars of experience and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WAKEFIELD. STANLEY ROYD HOSPITAL. Applications invited for post of JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER in Psychiatry. Accommodation available for a single person.

Address written applications, giving full personal particulars, details of training, experience, &c., and 2 names and addresses for reference, to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post is recognised for the F.R.C.S. Scale of salary £852 10s.–£55–£1182 10s. less a deduction of £170 for residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee,
c/o General Hospital, Warrington, Lancs.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEON and HOUSE PHYSICIAN required for the General (Sister Dora) Hospital and the Manor Hospital.

Apply Group Secretary, Walsall General (Sister Dora) Hospital.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (211 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital. This is a pre-registration post and is recognised for F.R.C.S. Salary according to the National Health Service scale. Post vacant now.

Please send copies of recent testimonials, with applications, to the Administrator.

WATFORD HOSPITALS. North West Metropolitan REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required for the above Hospitals. Application made for recognition. Post vacant immediately.

Application forms obtainable from and returnable to Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by 19th August, 1958.

WELSH REGIONAL HOSPITAL BOARD. Registrar in Thoracic Medicine, to serve Clwyd and Deeside Hospital Management Committee. Based at Abergele Chest Hospital, North Wales (163 Beds). Children (pulmonary and non-pulmonary), adults (pulmonary). Hospital has major thoracic unit. Resident. House available. Vacant 27th September, 1958. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) Applications are invited from duly qualified medical practitioners for the pre-registration appointment (resident) of HOUSE SURGEON. Immediate vacancy.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WESTON-SUPER-MARE GENERAL HOSPITAL. (104 Beds.) SENIOR HOUSE OFFICER (surgical) required at above Hospital. Immediate vacancy. Single residential accommodation available.

Applications, stating age, qualifications and experience, together with names and addresses of 2 referees, should be addressed to Group Secretary, Weston-super-Mare Hospital Management Committee.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (anæsthetics), resident, for duties at Leigh Infirmary and other hospitals in the Group. Married quarters available. Post recognised for D.A. and F.F.A. R.C.S. examinations.

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

WIGAN (near). WRIGHTINGTON HOSPITAL. Senior HOUSE OFFICER required for orthopædic cases. 247 Beds for orthopædic, mainly tuberculosis, and 94 Beds for chest cases. Salary and board charges in accordance with national scale.

Applications to Secretary with 2 names for reference.

WIGAN (near). WRIGHTINGTON HOSPITAL. Senior HOUSE OFFICER required for chest diseases. 247 Beds for orthopædic, mainly tuberculosis, and 94 Beds for chest cases. Salary and board charges in accordance with national scale.

Applications to Secretary with 2 names for reference.

WOKING AND CHERTSEY GROUP LABORATORY. Applications invited for post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer). The post is 1 of 2, and involves a half share in emergency service. Training available in all branches of clinical pathology. Post tenable for 1 year from mid-September. Salary £819 10s. p.a.

Applications, stating age, qualifications, &c., together with names of 2 referees, as soon as possible to the Director, Group Laboratory, St. Peter's Hospital, Chertsey, Surrey.

WOLVERHAMPTON. NEW CROSS HOSPITAL. (634 Beds.) HOUSE OFFICER (pre-registration), Medicine. Acute medical beds. Vacant now.

Applications to Hospital Secretary.

WOLVERHAMPTON. NEW CROSS HOSPITAL. Pre-registration HOUSE OFFICER in General Surgery. Post recognised for F.R.C.S.

Applications to Hospital Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) Pre-registration HOUSE OFFICER (general surgery). Post vacant immediately. Recognised for F.R.C.S.

Apply, giving age and qualifications and copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An associated hospital of the Birmingham University Medical School.) HOUSE OFFICER (pre-registration) E.N.T. Department. Post recognised for the D.L.O. and F.R.C.S. examinations. Vacant 10th September.

Apply, with copies of 2 testimonials, to the Secretary.

WOLVERHAMPTON. THE ROYAL HOSPITAL. House SURGEON for Thoracic Surgery and Casualty. Post recognised for F.R.C.S. Vacant immediately.

Apply, with 2 testimonials, to Secretary.

WORCESTER ROYAL INFIRMARY. House Surgeon (pre-registration or otherwise) required for General Surgery post at this busy general hospital of 213 Beds. The appointment offers wide and varied experience and is recognised for the F.R.C.S. examinations.

Applications to Hospital Secretary.

WORCESTER ROYAL INFIRMARY. House Surgeon (pre-registration or otherwise) required immediately for Orthopædic Department of this busy general hospital of 213 Beds. The appointment offers wide and varied experience.

Applications to Hospital Secretary.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. (210 Beds. Acute general.) The post of HOUSE SURGEON is vacant immediately.

Applications from either registered medical practitioners or pre-registration candidates, stating age, qualifications, experience, nationality and enclosing copies of 2 recent testimonials, to be forwarded to the Group Secretary immediately.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

WREXHAM. MAELOR GENERAL HOSPITAL (591 Beds) and WAR MEMORIAL HOSPITAL, WREXHAM (230 Beds). Applications are invited for HOUSE PHYSICIAN posts at the above Hospitals, to commence 1st August, 1958. The appointments are recognised for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire.

WREXHAM. MAELOR GENERAL HOSPITAL (591 Beds) and WAR MEMORIAL HOSPITAL, WREXHAM (230 Beds). Applications are invited for HOUSE SURGEON posts at the above Hospitals, duties to commence on 1st August, 1958. The appointments are recognised for the Diploma of F.R.C.S. (England, Edinburgh and Ireland) and are pre-registration posts.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, as soon as possible.

WREXHAM. MAELOR GENERAL HOSPITAL. (591 Beds.) Applications are invited for the post of PÆDIATRIC HOUSE PHYSICIAN at the above Hospital, to commence 1st August, 1958. The appointment is recognised for the D.C.H. and for pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, together with copies of 2 recent testimonials, should be addressed to the Group Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, Denbighshire.

WREXHAM (near). TREVALYN MANOR MATERNITY HOSPITAL, ROSSETT, near WREXHAM. (47 Beds.) Applications are invited for the post of HOUSE SURGEON at the above Hospital, to commence duties on 1st September, 1958. The Hospital is a Part II Midwifery Training School and deals with normal and abnormal midwifery.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to be sent to the Group Secretary, Maelor General Hospital, Wrexham, as soon as possible.

ST. JOHN'S, NEWFOUNDLAND, CANADA. GENERAL HOSPITAL. (475 Beds.) Applications are invited for the post of INTERNE in the Pathology Department of the above Hospital. Previous experience is desirable but not essential. The post is recognised for postgraduate training towards certification in Pathology by the Royal College of Surgeons and Physicians of Canada, and also recognised by the Royal College of Surgeons, England, for the Diploma in Pathology. Excellent opportunities exist for gaining extensive experience. Salary $2500 p.a., less $528 for maintenance, &c. Transport to St. John's will be paid by the Hospital.

Applications with full details, &c. to be forwarded to Dr. E. WILSON, Superintendent, General Hospital, St. John's, Newfoundland, Canada.

IBADAN, NIGERIA. UNIVERSITY COLLEGE HOSPITAL. The Board of Management invite applications from medical practitioners with the requisite postgraduate experience and qualifications for appointment as REGISTRARS or SENIOR REGISTRARS in the Anæsthetic Department.

The salaries offered are:—

Registrar: £1164 p.a. rising to £1212 p.a. as a second year Registrar.

Senior Registrars: £1428 p.a. rising by 3 increments to £1596 p.a.

In addition an inducement addition is payable to an expatriate doctor of £270 p.a. on a salary up to £1284 and £300 p.a. on a salary of £1285 and over.

The successful candidates will be expected to assume duty about October, 1958, and January, 1959, respectively.

The appointment will be initially for 1 tour of 12 months and will be renewable by mutual agreement for a further tour of 12 months.

On satisfactory completion of the agreement a gratuity of £37 10s. will be paid for each completed term of 3 months' service.

An outfit allowance of £60 is payable on first appointment.

Partly-furnished quarters are provided at a rental of 8½% of salary excluding inducement allowance, and an expatriate doctor appointed will be eligible for 7 days' leave on full pay for each completed month of service in Nigeria. A Nigerian doctor is eligible for 5 days' leave for each completed month of service.

Free first-class passages are provided for expatriate doctors and their wives on first appointment and on completion of the agreement. Free first-class passages to Nigeria will, in certain circumstances, be provided for non-expatriate doctors. Free first-class passages will be provided for vacation leave.

Candidates will be eligible for children's allowances in accordance with existing regulations.

Arrangements can be made to enable doctors to continue their National Health Service superannuation scheme contributions, and details of the revised salary and gratuity payable in such cases will accompany application forms.

Applications should be submitted not later than 23rd August, 1958, on the appropriate forms, which will be forwarded, together with additional information, on receipt of an addressed foolscap envelope by the Adviser on Staff Recruitment, London Office, University College Hospital, Ibadan, 57, Catherine-place, Palace-street, London, S.W.1.

YORK. MATERNITY AND FULFORD HOSPITALS. SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required from 15th October. Post is recognised for M.R.C.O.G.

Applications, stating age, qualifications, experience, nationality and names of 2 referees, to Group Secretary, York A and Tadcaster Hospital Management Committee, Bootham Park, York.

TASMANIA. LAUNCESTON GENERAL HOSPITAL. Applications are invited from qualified medical practitioners for the following positions:—

REGISTRAR in Medicine.
REGISTRAR in Radiology.
REGISTRAR in Pathology.

Duration of appointment 1 year. Consideration may be given to extending the appointment for a second year, provided service has been satisfactory during the first year.

Salary £1531 10s. p.a. Registrars who obtain a higher degree will be paid £200 p.a. in addition to the above salary.

Board, residence, and laundry are provided free. Single quarters only are available. Travelling arrangements made.

The Launceston General Hospital is recognised as a training school for higher qualifications by the Royal College of Surgeons (England), the Royal Australian College of Surgeons, the Royal College of Obstetricians and Gynæcologists (for gynæcology only), the Royal College of Physicians and Surgeons for Diploma in Anæsthetics, the University of Melbourne for Diploma in Diagnostic Radiology, The College of Radiologists of Australasia for their Diploma, the University of Sydney for Diploma in Clinical Pathology and Diploma in Anæsthetics.

Further particulars may be obtained by writing to the General Superintendent. B. W. GRIFFITHS, Secretary.

Public Appointments

LONDON COUNTY COUNCIL. Applications invited from medical practitioners practising in Wandsworth area under National Health Service for appointment as VISITING MEDICAL OFFICER to Milton Close, 78, Swaffield-road, S.W.18, for 51 elderly blind people. Remuneration £40 a year plus fees receivable from Executive Council in respect of residents and resident staff who may be on National Health Service list.

Particulars and application form from Medical Officer of Health, (PH/D.1/1422), County Hall, S.E.1, returnable by 18th August.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. SENIOR ASSISTANT MEDICAL OFFICER (Male) required initially in Area 6 (Wembley and Willesden). Whole-time for administrative and clinical work. Approval by Minister of Education for ascertainment of educationally subnormal children desirable. Diploma in Public or Child Health advantage. Required to act as Deputy Medical Officer of Health for Borough of Willesden for 40 % of whole-time. Salary as for mixed appointments, £1693 13s. 4d.–£2058 13s. 4d. Established, subject to medical assessment. Prescribed conditions.

Apply, stating age, qualifications, experience and names of 2 referees, to Joint Area Medical Officers, 215, Chevening-road, Kilburn, N.W.6, by 23rd August. (Quote X.946L.) Canvassing disqualifies.

MIDDLESEX COUNTY COUNCIL. County Health DEPARTMENT. ASSISTANT MEDICAL OFFICER (whole-time) required initially in Area 4 (Finchley and Hendon). Duties concerned with the supervision of the health of mothers and young children and the School Health Service. Diploma in Public Health or in Child Health. Previous local authority experience advantage. Salary £1050–£50 (3)–£55 (5)–£1475 p.a. inclusive. Established, pensionable, subject to medical assessment. Prescribed conditions.

Apply, stating age, qualifications, experience and names of 2 referees, to Area Medical Officer, Town Hall, Hendon, N.W.4, by 30th August. (Quote X.866 TL.) Canvassing disqualifies.

BUCKINGHAMSHIRE. COUNTY OF BUCKINGHAMSHIRE. Applications are invited from registered medical practitioners holding the Diploma in Public Health or its equivalent for the joint appointment of MEDICAL OFFICER OF HEALTH for the Amersham Rural, Beaconsfield and Chesham Urban Districts, and DEPUTY DIVISIONAL SCHOOL MEDICAL OFFICER AND ASSISTANT COUNTY MEDICAL OFFICER for the Bucks County Council. The person appointed will be employed for 6/11ths of his time as Medical Officer of Health for the Districts mentioned, and for the remaining 5/11ths as Deputy Divisional School Medical Officer and Assistant County Medical Officer for the Bucks County Council. The combined salary scale will be £1657 0s. 11d., rising to a maximum of £2018 10s. 5d. p.a. Travelling and subsistence allowances will be paid on the appropriate scale. The appointment is superannuable and subject to medical examination.

Further particulars and forms of application can be obtained from the Clerk of the County Council, County Hall, Aylesbury, to whom applications must be delivered by 1st September, 1958.

DEWSBURY. COUNTY BOROUGH OF DEWSBURY. Applications are invited for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER of the County Borough of Dewsbury. Applicants should be registered medical practitioners, and possession of a Diploma in Public Health is desirable. Preference will be given to candidates approved previously by the Ministry of Education for ascertainment of educationally subnormal children. The salary is £1303 6s. 8d. by 4 increments of £55 to £1523 6s. 8d. p.a., plus a car allowance (at present £112 p.a.). Previous experience will be taken into consideration in determining the commencing-point on this scale. Housing accommodation will be available if required. The appointment is permanent and superannuable and the successful candidate will be required to pass a medical examination.

Particulars of the duties and other conditions of the appointment, together with application forms, may be obtained from the Medical Officer of Health, Municipal Buildings, Halifax-road, Dewsbury, Yorkshire, to whom applications should be sent on or before Saturday, 30th August, 1958.

Town Hall, Dewsbury. A. NORMAN JAMES, Town Clerk.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointment as Appointed Factory Doctor is vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
PORTLAND ..	DORSET ..	16TH AUGUST, 1958

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in parentheses after the place-name indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows:—

ENGLAND AND WALES

Accrington (Accrington).
Aldershot (Aldershot).
Lydd (Kent) (Ashford (Kent)).
Newnham (Gloucester).
Hinckley (Hinckley).
Ferryside (Llanelly).
Winkleigh (Okehampton).
Ampthill (Bedford).
Stocksbridge (Sheffield).
Romiley (Stockport).
Portland (Weymouth).
Wallasey (South) (Liverpool).

SCOTLAND

Galashiels (Galashiels).
Barrhill and Pinwherry (Girvan).

CORK SANATORIA BOARD. Vacancy for Temporary Whole-time ANÆSTHETIST. Salary £2114 p.a.

Application form and particulars may be obtained from the County Manager, Courthouse, Cork, with whom completed applications should be lodged not later than 12 NOON on Saturday, 16th August, 1958.

WESTERN AUSTRALIAN STATE PUBLIC SERVICE. PUBLIC HEALTH DEPARTMENT. DIRECTOR, Laboratory Services (Permanent).

Salary: £A3380 (gross) p.a. on current basic wage.

Duties: to provide clinical pathological service to new 216-Bed Perth Chest Hospital and normal microbiological service in relationship to general epidemiology, water, and food and perform some industrial pathology. Subsidiary laboratories being formed in association with several country hospitals and virus diagnostic laboratory being established with advice and under direction of Professor of Microbiology, University of Western Australia.

Transport: a reasonable amount will be allowed for transport of appointee and dependent family to Western Australia, provided appointee enters into bond to serve the State for a period of at least 3 years.

Conditions of service: superannuation benefits, 3 months' long-service leave after 7 years' continuous service, cumulative sick-leave entitlements and other general conditions applicable to permanent public servants.

Further information may be obtained from the undermentioned.

Applications, closing 3rd September, 1958, stating age, marital status, qualifications and experience, should be forwarded, in duplicate, to the Western Australian Government Office, 115, Strand, London, W.C.2.

PUBLIC SERVICE OF TASMANIA. Applications are invited for the undermentioned permanent superannuable positions in the Mental Health Dvision of the Department of Health Services. Appointments will be made in accordance with the provisions of the Public Service Act, with generous recreation, long service and sick leave. Applicants should possess medical degrees registrable in Tasmania. Commencing salary within each range will depend on qualifications and experience. Holders of Dip. Psych. Med. will receive additional allowance of £100 p.a.

PSYCHIATRISTS (2 positions). Salary range £A2472–£A2897 p.a. 1 appointee will be stationed at the Divisional Headquarters in the capital city of Hobart, and the other at the northern city of Launceston. Applicants should have sound clinical experience in adult and child psychiatry. Duties will include reports on cases referred by Courts and other authorities, consultative service to hospitals and institutions, psychiatric treatment of adults and children, and similar professional work.

DEPUTY MEDICAL SUPERINTENDENT, Lachlan Park Hospital, New Norfolk. Salary range £A2347–£A2572 p.a. Applicants should have sound clinical experience in psychiatry with administrative ability. Duties include psychiatric treatment of patients and administrative duties as Deputy to the Medical Superintendent. An official residence will be provided at a moderate rental, with free milk, vegetables and laundry.

MEDICAL OFFICER, Lachlan Park Hospital. Salary range £A1997–£A2337. Duties include general medical care of patients and psychiatric work under supervision of Medical Superintendent. Residence and supplies, as for Deputy Medical Superintendent.

Applications, in duplicate, giving full personal particulars and information regarding academic qualifications and professional experience, should be lodged with the Agent General for Tasmania, 457, Strand, London, W.C.2, within 3 weeks after the publication of this advertisement.

LINDSEY COUNTY COUNCIL. Health Department. Applications invited for post of ASSISTANT MEDICAL OFFICER for Brigg and Barton Area of Lindsey, mainly in connection with examination of school children. Diploma in Public Health an advantage. Salary £1050 rising by 3 increments of £50 and 5 of £55 to a maximum of £1475.

Further particulars and application forms from Dr. C. D. CORMAC, Health Department, County Offices, Lincoln.

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

OXFORD COUNTY AND CITY. Applications invited for VACANCY (small Rural practice situated North Oxfordshire (near Banbury)). List at present approximately 1062; of these 1032 are dispensing patients. Practice suited to a doctor already established in single-handed practice requiring smaller list. Residence/surgery likely to be available. Apply on Form E.C.16A to the undersigned, not later than 7th August, 1958.

V. R. PARRY, Clerk of the Council.

73, George-street, Oxford.

Hospital Services: Non-Medical Appointments

BIRMINGHAM CHILDREN'S HOSPITAL. Biochemist, preferably with postgraduate experience, required for research into lipoprotein metabolism in childhood diabetes. Post unestablished but could provide opportunity to prepare for higher degree. Salary £550–£1000 according to experience.

Applications to H. B. SALT, Department of Biochemistry, Children's Hospital, Birmingham, 16.

Miscellaneous

Doctors required to do night calls on a payment-per-call basis, car and medical equipment provided. Excellent opportunity to gain valuable experience in a well-remunerated and congenial appointment.—Please ring REN 6411 for appointment for interview.

Doctor's Widow, experienced housekeeping, children, trained nurse, car driver, attractive appearance, requires interesting useful occupation, home or overseas.—Address, No. 417, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Evans Medical Supplies Ltd. Copywriter. There is a vacancy in the Company's Medical Information Department for a suitably qualified man or woman who can write clear and attractive English. The person appointed will be expected to abstract from the medical journals, compile and edit medical literature for the Company's products, and supervise the Medical Information Library. A pharmaceutical qualification would be an asset; an understanding of medical terminology and therapeutics is essential. Contributory pension scheme, 5-day week, &c., with good prospects. Remuneration will be related to qualifications, ability, and experience.

Apply in confidence, giving details of age, education, and experience, and enclosing, if possible, specimens of previous work, to the Pharmaceutical Development Director, Evans Medical Supplies Ltd., Speke, Liverpool, 24.

Epping, Essex. New Semi-detached Property, designed for professional purposes, and very well fitted. 5 bedrooms, bathroom; 4 principal rooms, kitchen and cloakroom on ground floor; garage; small garden. Price £6350 freehold.—Apply AMBROSE AND SON, 145, High-street, Epping. Telephone: Epping 2666.

Wanted, private practice or partnership N.H.S. practice with view to succession, London or radius 25 miles. Ample capital for house purchase.—Address, No. 413, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Part-time Consulting Rooms to be Let in Harley-street. Rents from £50 per half-day session. Apply: ELLIOTT, SON AND BOYTON, 86/87, Wimpole-street, London, W.1. WEL. 8367.

Last Minute Holidays Abroad. If you do not like mass tour arrangements we give personal attention to your holiday—rail, sea or air—with good hotels in every grade and all countries. Write or phone: BUSINESS AND HOLIDAY TRAVEL LTD., Grand Buildings, Trafalgar-square, London, W.C.2. WHItehall 4114/5.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £2 2s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Doctors requiring applications, theses copied: Write to MANTON (WESTMINSTER) LTD., 98, Victoria-street, S.W.1 (VIC. 0141), who are specialists.

Completely portable electrocardiograph in good condition for sale, £40. Second machine available for spare parts, £5. Machine is a Sanborn Instomatic Cardiette, internal battery operated, photographic recording, weighing 23 lb. Full instruction manual. Needs new batteries.—Apply, Address No. 416, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists. Electric machines.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Old medical and scientific books, pictures, manuscript notebooks, letters, &c., wanted by a collector.—Address, No. 343, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

Pregnancy Diagnosis (Fee 21s.). Specimens of urine accepted for testing (Hogben test) from doctors, hospitals and clinics anywhere. Results available within 24 hours. Fee reduced for hospitals and clinics. Telephone or write for details: FAMILY PLANNING ASSOCIATION, 64, Sloane-street, London, S.W.1. SLOane 0451 or 9112.

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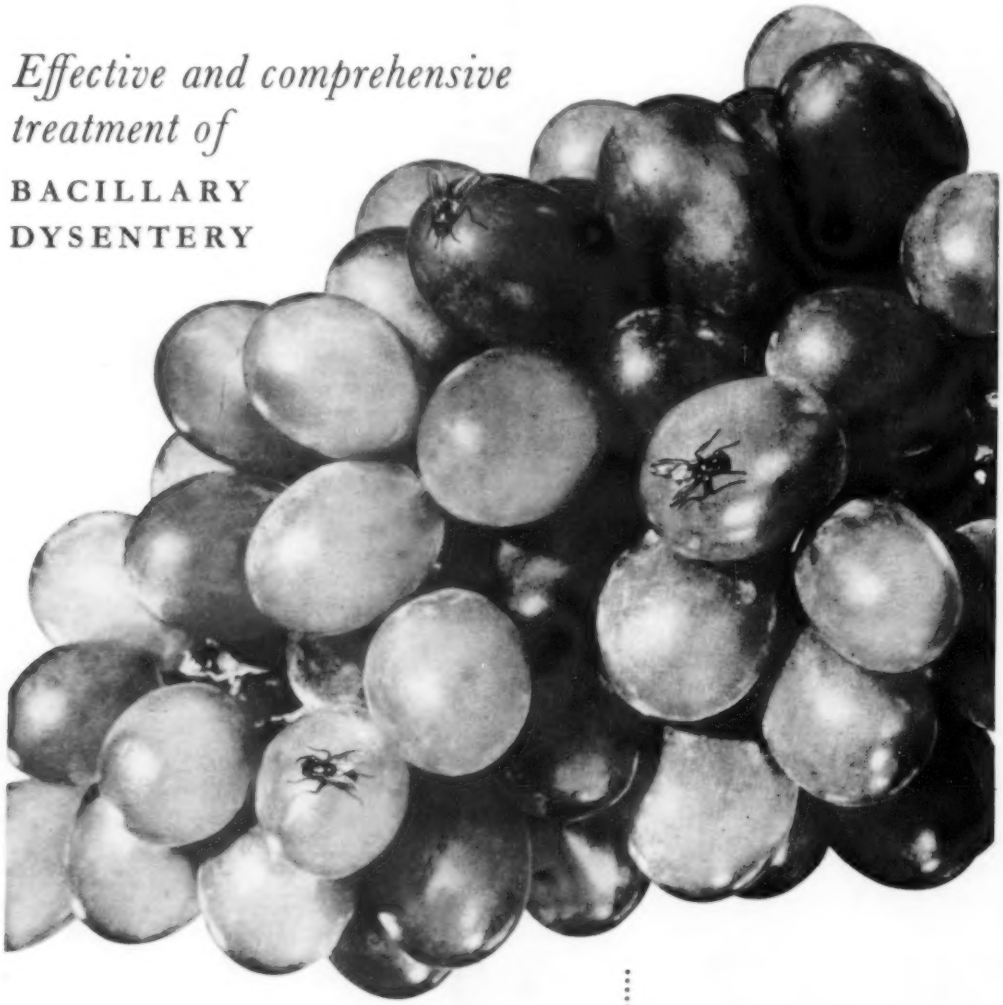

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